The Louisianna Legistature and States Rights!

SPEECH

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HON. LEWIS H. STEINER.

IN THE

SENATE OF MARYLAND.

FEBRUARY 23rd, 1876.

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REPORT OF THE MINORITY OF THE STANDING COMMITTEE ON FEDERAL RELATIONS.

The undersigned, the minority of the Committee on Federal Relations, to which was referred sundry resolutions, passed by the Legislatures of Missouri, Virginia and Delaware, in reference to alleged outrages committed by Federal soldiers at the organization of the Legislative Assembly of the State of Louisiana, January 4, 1876, begs leave most respectfully to dissent from the report of said Committee, made to the Senate, Friday, February 4th for the following reasons :

1. The statements, in the preamble to the resolutions reported by the majority of said Committee, in reference to the alleged outrages are not sustained by the report of the Congressional Committee, which was present on the occasion of the organization of the said Legislative Assembly, and are really based upon highly colored statements made by interested parties.

2. The resolutions themselves emphasize statements in regard to the origin and nature of the Federal Government, its powers and prerogatives, which are not sustained by the history of the formation of the Constitution of the United States, or by the *ipsissima verba*, of that venerable document, and which the minority of the Committee considers political heresies.

3. It is unwise, in view of the time that has elapsed since the occurrence and of the quiet that has followed the storm of angry passion that then prevailed, to provoke a discussion of the occurrence itself, which will be fraught with anything but a pacific effect upon the popular mind.

4. It is unnecessary to submit abstract questions in regard to the origin and nature of the Federal Constitution to the decision of the General Assembly, and to consume valuable time in their discression, when no urgent neces-

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sity may exist for such an extraordinary departure from the ordinary legislation of business.

For the above reasons, the undersigned desires to declare his emphatic dissent to the Report, and respectfully asks that the same may be spread upon the Journal of the Senate.

LEWIS H. STEINER.

Senate Chamber, February 23, 1876.

SPEECH

Mr. President:—The proper discussion of the occurrence referred to in the preamble to these Joint Resolutions, as well as the proposition laid down in the Resolutions themselves, would require much more time than it has been my good fortune to command, since their introduction by the Chairman of the Committee on Federal Relations in obedience to the instructions of a majority of said Committee. I opposed in committee any action on the subject, because it seemed to me unnecessary and uncalled for, and because I presumed that it would be in some way regulated and modeled after that of the three States who made utterances on this subject, more than twelve months since. On examining the report of the majority of the Committee, I felt constrained to enter my brief but earnest protest, as the minority, against the same, and in rising now to desire the attention of the Senate, it is with the view of giving some reason for my course, for the faith that is in me. Moreover, the firm conviction that I represent the views of the majority of the constituency which has sent me here as their representative; emboldens me to undertake a task, from which I might otherwise shrink, and which I now wish were in abler hands.

In discussing facts, (when the witnesses are biased by partizan feelings,) one is always puzzled, at first to know which witness is entitled to credence. Each presents the most plausible statement possible, and is seemingly entitled to confidence of the student, and yet the discrepancies are generally irreconcilable even with the most liberal allowance for what mathematicians call. "*personal equation.*"

The student must endeavor to find who is naturally influenced by the least prejudice, whether from natural temperament, personal relations or partisan feelings, and, then sifting his testimony from all that would savor of prejudice, must test the same by comparison with the testimony of others, the surrounding circumstances and the probabilities or improbabilities thereunto belonging. If witnesses can be found who have not been *personally* interested in the occurrence under consideration, naturally their testimony is entitled to special recognition, notwithstanding their political status may suggest the possibility of some bias.

In probably no occurrence of the last decade will this course of procedure be more imperatively necessary than the subject of the organization of the Louisiana Legislature, in January. 1875. Highly colored partizan accounts, proceeding from both the parties, bear on their very face much that makes them very unreliable as evidence in the discussion of the exact nature of this occurrence. Each has sought to make his own side free from all blame, and to cast a terrible burden of obloquy and reproach upon that of his opponents. But fortunately for the calm, dispassionate student, we have the testimony of eye-witnesses, who were not parties to the difficulties, and who have given their account under the solemn official oath that bound them to be impartial and free from favor or partiality. The report of the Congressional Committee, who were detailed by the Select Committee on the condition of the South, to visit New Orleans for the purpose of examining into the state of affairs existing, and the outrages alleged to have been committed in Louisiana, is entitled to special consideration. Their account of what they witnessed with their own eyes, or became personally cognizant of, and the conclusions at which they arrived, becomes of paramount value and importance. For if the so-called interference with the normal action of the Legislature of Louisiana be found to be the result of a call for aid from the majority of that body, and to be divested of the appearance of violent interference, then a protest against what has been called an outrage is unnecessary and uncalled for. Hence we turn with great readiness and satisfaction to the report of the committee, composed of Messrs. Foster, Phelps and Potter, presented to the House of Representatives, January 14, 1875, only two days after the occurrence now under consideration, which committee had been invited by Messrs. Kellogg and McEnery to arbitrate upon their respective claims to office, and to whose decisions the rival parties, through these gentlemen expressed their willingness to submit.

Their report on the organization of the Louisiana House of Representatives is substantially, as follows: on January 4, 1875, at noon, the House of Representatives convened in accordance with the Constitution of the State, and the Clerk of the last House, Mr. Vigers, called the meeting to order and procceeded to call the roll, when 102 persons answered to their names 50 of these were admitted to be Democrats and 52 Republicans. These had in preliminary caucuses determined to support the names of Mr. Wiltz, and Mr. Hahn, respectively, for the office of Speaker. The Clerk was by the constitution the presiding officer, and, after completing the calling of the roll, he announced the first business to be the election of a Speaker. Had that been performed, the majority would have placed Mr. Hahn in the Chair, but a Mr. Billieu sprang to the floor and nominated Mr. Wiltz as temporary chairman, and, acting without any reference to the Clerk, put the motion at once, "which was received by loud yeas, and followed by as loud nays," but Mr. Billieu decided it was carried. Mr. Wiltz, disregarding the prerogative of the Clerk as temporary presiding officer, sprang to the platform, followed by a Justice, present for the purpose, who immediately administered the oath. Wiltz then seized the gavel and rapped the House to order, seized Viger's chair and pushed him from his place by force. He then "administered the oath *en masse* to the members who rose to receive it. A Clerk was nominated by some one, and Wiltz put the motion and declared it carried." A Sergeant-at-Arms was also elected with the same indecent haste, and then "a number of assistant Sergeants-at-Arms were appointed, who promptly appeared wearing badges," on which were printed "assistant Sergeant-at-Arms." I now quote literally the report of the Committee.

"While the above-mentioned motions were being put, members objected and called for the yeas and nays, all of which was disregarded and pronounced out of order by the acting Chairman. Colonel Lowell, a Republican member, made the point of order that the Constitution of the State allowed any two members to call for the yeas and nays on any motion, but the temporary Chairman decided the point was not well taken until a motion for permanent organization. Next, a motion to go into an election for a permanent organization was offered, and decided premature. Against this ruling the Republicans protested. A motion to seat the Democratic members alleged to be elected in the four parishes. referred to the Legislature, was immediately made and carried. During this stage there was much disorder. The Republican members protested, but their protests were disregarded. Mr. Lowell, (Republican,) moved that the House proceed to a permanent organization, and that the vote be taken upon the roll of the returning board. This motion was declared lost, Mr. Lowell protesting. Mr. Matthews, (Republican,) then nominated Mr. Lowell as temporary Chairman, put the motion amidst great confusion and disorder, and declared it caried. Mr. Lowell declined to serve. The House then proceeded to elect a Speaker. The roll was called by the clerk—Terzevant—who reported fifty-five votes for Wiltz, and two votes for Hahn, and one—Mr. Wiltz's own—blank * * * After the announcement by the clerk of the vote, Wiltz was sworn in as Speaker, and proceeded to swear in others present so far as they came forward to be sworn."

All this was done in the midst of the utmost confusion and disorder. Police Officers to the number of 27 were present. When the Republicans undertook to leave the room, where the minority, by dint of superior bullying and mastery of dexterous artifice, had obtained control so wrongfully of the situation, the master-spirit, Wiltz, gave order to the Sergeant-at-Arms to prevent egress from, or ingress into the hall. This added additional fuel to the flames of passion then flashing forth on all sides. Turbulence and confusion increased, pistols were displayed and there was imminent danger of bloodshed. Notwithstanding all this, most of the Republican members managed to leave the room, when a Mr. Dupre, a Democratic member, moved "that the Speaker be requested to ask Col. DeTrobriand to preserve order." The motion was carried and the mover at the head of the committee appointed for the purpose waited upon Col. De Trobriand and requested interference of him and the United States troops to preserve the peace. Col. De Trobriand was an officer of the United States, stationed in New Orleans, and felt it his duty to aid in the preservation of order when called upon by proper authority, and, in the confusion then existing as to the proper incumbent of the office of Governor, would naturally recognize the Legislature of the State as such proper authority. Hence he complied promptly with the invitation, and entered the legislative hall with the committee of five sent to invite his presence and assistance, and attended with only one Aid. He was greeted with shouts of welcome and prolonged cheers from the Democratic members, who had deliberately invited his presence. Whatever intervention of the military there was, resulted from a polite invitation from the Democratic members of the House of Representatives of Louisiana; had he carried out *their* views instead of doing that which gave voice and place to those they were suppressing—the Louisiana outrage would never have formed the subject of enfuriated tirade and oratorial display from their friends, nor would the resolutions of Virginia, Delaware and Missouri been looked upon as proper forerunners of similar proposed resolutions in the General Assembly.

Following up closely the history of the occasion, we find that Col. De Trobriand asked Wiltz, whether he could not preserve the peace without calling upon him as an army officer for assistance, and the answer was that he had tried and failed so to do. Thus appealed to, Col. De Trobriand addressing the turbulent, seething crowd, secured order and quiet so satisfactorily to Wiltz, that, to use the words of the committee, "the Speaker thanked him in the name the House for his courtesy." The legal majority of 52, however, made an appeal to the Governor, that by fraud and violence they had been deprived of their rights, and asked that they might be put in possession of the same. He invoked the authority that Wiltz had previously invoked, namely, the services of Col. De Trobriand, who entered the hall again and, as a necessity to ensure justice to the majority, removed five of the persons sworn in who had not been returned by the returning Board, and succeeded in securing the admission of the 52 members who were violently prevented from entering the hall by the order of Wiltz. The majority of those on the roll of the clerk being again admitted to their seats, the Clerk called the roll anew and the organization was effected, in accordance with the Constitution of Louisiana and its laws in regard to the organization of the House of Representatives.

Now, if there was error in all this—where was the initiative? When did the error begin? The Wiltz party made the first appeal, and were satisfied with the result, so satisfied that thanks were returned to the army officer appealed to, for preventing bloodshed. But when an appeal was made for full justice to all concerned, and that appeal by competent authority,--the power employed was used only to place in their seats those who had been returned as members by the returning Board, and to remove those who must be looked upon in the light of usurpers until the House, which was the judge of the election of its members, should decide, when fully and duly organized, whether those returned or those contesting were entitled to seats. The resolutions state that "five of the members of the said House of Delegates were sized and forcibly ejected," and that "other persons, not elected by legal voters of the State, were by the said troops installed as members of the said House of Delegates in lieu of the five ejected members." Now, as the former were not returned as members, who could declare that they were entitled to their seats in face of the fact that there were five others who were returned to the same seats that they claimed? No power on earth, save the Body itself, after it was properly organized by a majority of the members returned as duly elected. Whatever was done by Col. De Trobriand, whether at Wiltz's request, or at Governor Kellogg's, was done in accordance with what seemed to be a proper authority, from which such an appeal and demand could be properly made.

The relation of the President to the interference can be understood by the following extract from his message to the Senate, dated January 13, 1875.

"Respecting the alleged interference by the military with the organization of the Legislature of Louisiana on the 4th instant, I have no knowledge or information which has not been received by me since that time and published. My first information was from the papers of the morning of the 5th of January. I did not know that any such thing was anticipated, and no orders nor suggestions were ever given to any military officer in that State upon that subject prior to the occurrence. I am well aware that any military interference by the officers or troops of the United States with the organization of the State Legislature or any of its proceedings, or with any civil department of the Government, is repugnant to our ideas of government. I can conceive of no case, not involving rebellion or insurrection, where such interference by authority of the General Government ought to be permitted or can be justified. But there are circumstances connected with the late legislative imbroglio in Louisiana which seem to exempt the military from any intentional wrong in that matter. Knowing that they had been placed in Louisiana to prevent domestic violence and aid in the enforcement of the State laws, the officers and troops of the United States may well have supposed that it was their duty to act when called upon by the Governor for that purpose."

I have made no reference to the right or wrong involved in the appeal to the military officer to quell a riotous assemblage. The appeal was made by both parties to him, pretty much as an appeal might be made to a *posse comitatus* of citizens, and the army officer acting, under both appeals, as though it was his duty to aid law and order, performed the acts which have produced all this indignation. But how do Col. De Trobriand's act, with his three or four soldiers—and no more were used in the house, affect the indignation felt at Gen. Sheridan, when it is a matter of fact that he was not in command at the time of these occurences, and did not assume such command until half-past nine at night, when all was over and done. The military appealed to were not under his command at the time, and he could not be held responsible in any way for any of their acts. True, he sent some dispatches which have been misrepresented and distorted, so as to make his name a by-word with those who look at these occurrences and him with prejudiced eyes, and which, if the very worst said of them were true, could only be condemned as imprudent utterances of a soldier, better trained in the use of his sword than the pen. But Sheridan bore no part in the occurrence which is here made the object of reprobation and condemnation, and hence his name has no place in any series of resolutions drawn up with that object in view.

I might here close my remarks as I have shown, I think, that the occurrence was one marked with such turbulence that both parties involved felt the necessity of invoking extraneous aid, which aid I might have said was given without the introduction of a single weapon of war, of invoking extraneous aid for the purpose of securing peace, order and the peaceable organization of the members duly returned as properly elected to membership in the House of Delegates of the State of Louisiana, but the resolutions themselves set forth as incontrovertible principles, unsound statements as regards the origin of the United States, and the relations of the same to the separate and individual States, which I can not permit to pass without uttering my feeble discent. In referring to these I can only regret again that the time has not been at my command, amid the multifarious duties of the Session, to gather authorities in support of what I conceive to be the true nature of the General Government and the source from whence it derives all its powers. The second resolution says: "that all the powers of the Federal Government are grants and concessions from the several *States* composing the United States, and are limitations and restrictions upon the power of the several States, voluntarily parted with by the States, and granted by them to the Federal Government." This abstract proposition, if recognized, will justify the withdrawal of any one of the States from the contract, will justify any one in unsettling the whole by repeated threats of such withdrawal, will make the Union, for which so much treasure has been expended and blood shed, an unstable structure subject to whim and caprice, no longer the object of admiration and pride at home and abroad because of its strength and permanence, but a bundle of States liable at any time to be cast asunder by the wicked hand that would cut the binding chord.

Let us briefly look at the origin of the nation, see how, after trying the plan of association or confederation, it finally came to a safe haven in the idea of organic union. I say briefly, for the limited time allowed for preparation, has only enabled me to bring together some of the striking points in the progressive movements, which culminated in the adoption of the Constitution of the United States.

It was a long time before the idea of revolution gained a place in the thoughts of the fathers of the country. With all the oppressive legislations of the mother country, notwithstanding all "the injuries and usurpations" that had "in direct object, the establishment of an absolute tyranny over these States," as set forth in the grand old document which was, at the same time, the indictment of a tyrant for the misdeeds of his government and a Declaration of Independence, as well as a renunciation of "all allegiance to the British crown" and a dissolution of all political connection with "the State of Great Britain," notwithstanding the long list of abuses and usurpations to which they were subjected, the revolutionary fathers did not rashly enter upon the perilous venture that eventuated in successful separation from Great Britain. Finally, however, with a bond of Union, loose and uncertain when domestic difficulties should test its strength, but all powerful as against a foreign foe, they bound themselve together as confederated colonies, claiming as such that "they wers, and of right ought to be free and independent States; that they were absolved from all allegiance to the British crown, and that all political connection between them and the State of Great Britain, was, and ought to be, totally dissolved; and that, as free and independent States, they had full power to levy war, conclude peace, contract alliances, establish commerce, and to do all other acts and things which independent States may of right do." The idea which then prevailed, and which the exigency of the times particularly emphasized, was an external mechanical union for common defense, and, should the necessity require it, for common offense.

The fourth of July, 1776, was the beginning of a new era in the history of the country, and well may we unite, throughout the length and breadth of the land in celebrating the centennial anniversary of a day so glorious as the initial point in the history of Liberty and Equal Rights. Union of some kind, somewhat loose, ill defined and imperfectly understood, was then determined upon, comprising thirteen colonies regularly organized, and a wide expanse of unoccupied and uncultivated territory. This idea assumed a more definite shape, when "the articles of confederation and perpetual union between the States" were solemnly adopted on the fifteenth day of November, 1777, although some of the States did not give in their adhesion to the same until the year 1781.

Meanwhile the idea of nationalism grew and developed from the necessities of the situation itself. That, oneness of life should penetrate the whole began to be recognized on all sides. Something higher and more enduring than the mechanical connection, which resembled the bundle of lictor's rods, began to be ardently longed for. It might be true that "in union there was strength," that the motto "united we stand, divided we fall" was of sufficient significance to bind States together for the resistance of a common enemy. Such alliances for offensive and defensive purposes had been made, from time immemorial, between nations totally unlike in origin, habit, custom and modes of thought, but they had never resulted in that organic, living union which must penetrate and vivify a nation, In order that the country should take its place among the great powers of the world, a common nationality was required, and it was felt that, unless one life penetrated and enlivened the whole, the Confederacy would prove eventually to be nothing more than a collection of centrifugal forces, each striving to fly off from the common centre and revel in the extravagancies of wild separatism. Hence the necessity for the formation of the Constitution of the United

States, by the people themselves—the original source of all the power and government of the separate States in which, although the old name was retained for the country, it was now employed to set forth and indicate the fact that a common life was to pervade the whole, manifesting itself in laws and ordinances, in usages and customs that should bind the subordinate States most securely and enduringly together. To use another's language—"the new government was not to be a mere change in dynasty, as in a form of government, leaving the nation or sovereignty the same, and clothed with all the rights, and bound by all the obligations of the preceding one; but it was to be a new political body, a new nation, then to take its place in the family of nations." It was not to be "a mere compact among the States, but a government agreed to by the people of the United States." The centrifugal forces were not to be destroyed, but to be held in check and to be kept within specified limits by a federal centripetalism, each set of forces so evenly balanced and regulated as not to interfere with each other, but rather to promote mutual elasticity as well as perpetuity.

The preamble of this grand old document, which is properly styled "the epitome of the whole instrument," does not recognize the existence of divisions among the people, fails to mention the States, but directly asserts its origin to be that which constituted the essence of the States themselves—the People.

It is said to have been one of the last clauses adopted by the Convention, and hence must be looked upon as no rash utterance, but the result of the careful thought and study of men who had been contending with the difficult problem of preparing a form of government that should be sufficiently strong to withstand ordinary and extraordinary assaults from within and from without. Hence this preamble is the key note that will reveal the spirit of the whole document to which It is the simple but grand preface. "*We, the People of the United States*, in order to form a more perfect union, establish justice, insure domestic tranquility, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution of the United States of America." When the Confederate States formed their Constitution, with the view of preventing any such interpretation of the nature of the government they were creating, they qualified the clause, "We, the people of the Confederate States," with the phrase "each State acting in its sovereign and independent character." In the one case "We, the People" had united to form "a more perfect union," and in the other, the action proceeded from the States with right of withdrawal from the compact formed. Of the former an authority (Pascal) says: "The true doctrine would seem to be, that the Constitution was adopted by the people of the several States, which had been previously confederated under the name of the United States, acting through the delegates by whom they were respectively represented in the Convention which formed the Constitution; and he quotes Mr. Justice M'Lean as having said it was formed "by a combined power exercised by the people through their delegates limited in their sanctions to the respective States."

Thus with a government, real and springing from the people, it was supreme within the limitations laid down by the people themselves. In its proper sphere it was a sovereignty, not interfering nor intended to interfere with the separate and distinct sovereignties of the separate States. With the view of sharply defining the two, the tenth amendment was adopted, which says: "The powers not delegated to the United States by the Constitution—that is by the organic law which the people had enacted and ordained through their Convention, and afterwards ratified by them through the action of their State government—nor prohibited by it to the States, are reserved to the States respectively, or to the people," who are here again impliedly given the power to amend their organic law. The States had never granted or conceded powers to the general government. These were granted by the people themselves, who the preamble distinctly sets forth as the authority ordaining and establishing the Constitution. The States had voluntarily parted with no powers, these were specifically conferred by the people in their sovereign capacity.

The Constitution was adopted, September 17, 1787, but went into effect only on the fourth of March, 1789. Thus eleven years after the adoption of the great Declaration witnessed the conclusion of the deliberations of the Constitutional Convention, and thirteen years after the separation from Great Britain, marked the period when the nation had assumed an organic unity, and thrown aside its characteristics of a confederation. The first era of our national history is memorable for the great struggle with the powers of Great Britain, and the evils towards which her great statesmen directed their special efforts were from without. Hence alliance offensive and defensive against a common foe, was all that was required, but this second era was devoted to perfecting the organization so that it might be endowed with the power of self-preservation, of preventing disintegration and political suicide. It furnished a sphere for the development of the ideas of "Liberty, Equality and Fraternity," never before known on the globe, to use the words of the scholarly Guyot: "*Liberty* to unfold all the living forces, and all the good tendencies of man, but not his evil tendencies; the *equality* of rights lying in the moral nature of man, but not that absolute, impossible equality which is contrary to nature and the course of Providence, and annihilates all progress; that *fraternity* which is the law of the Gospel, and substitutes, for the selfishness that isolates and kills, the fraternal love and devotion that unites and makes alive; a free people, a people of brethren; unobstructed individual growth, attended by all the advantages of social life; diversity in unity."

The doctrine of States Rights, which it is attempted to emphasize in the resolutions, finds no home in the history or the *ipsissima verba* of the Constitution, although it has formed the chief topic of innumerable discourses by the great abstractionists of the past. Its dangerous character lies chiefly in the right it seems to give to any one or more of the States to withdraw from the Union, just as the arm or leg might be endowed with the power of separating itself from the body and attempting to perform all the functions of life as a distinct existence. It is the fruitful source of dissatisfaction and discontent. We have seen, but a few years since, how it brought on the nation a civil war of the hugest dimensions, which was closed by the success of the national idea. And now, while we have not yet quite recovered from the effects of this gigantic struggle to maintain the national life, smarting still under the effects of the wounds of war, and tottering under the heavy load of taxation it has laid on the country, we are asked in the Senate of Maryland to resuscitate these dead and buried States Rights notions, to rehabilitate them in modern attire, and to attach them to indignant utterances against army officers who were called upon by the authority of a State Legislature and a State Governor to lend a helping hand in the suppression of riot and imminent bloodshed.

I hope, Mr. President, that the resolutions will be rejected by the Senate. I have tried to show that the statement of facts enumerated in the preamble is not justified by the account furnished by eyewitnesses to the occurrence; that the officer—as gallant and brave a man as ever wore a sword at his side—held up as a mark of indignation and reproach, was not in command at the time of the occurrence and did not take command until hours after the event had occurred; that the assumption of the origin of the federal constitution and the source of the powers of the same government as being from the States is not justified by the very words of the preamble to the Constitution itself.

But why should the Senate take up for special consideration the occurrence of January 4, 1875. It has been settled long since. The contending parties consented to a friendly arbitration of their respective claims and difficulties? That arbitration was had and the results were recognized as binding at the time. True, the Legislatures of Virginia, Delaware and Missouri, adopted indignant expressions in regard to the part Col. De Trobriand played on the day of the organization of the Legislature. Grossly exaggerated accounts of the occurrences incident to that organization had been circulated by the newspapers throughout the land. In the heat of excitement a coloring was given to those occurences by no means in accordance with truth. But these exaggerated statements have been made to give way to the cool, dispassionate accounts of unbiased witnesses. Quiet has been restored where all was turbulence and riotous disorder. Why resurrect this corpse from its political grave, and drag the putrescent mass into the light of day? Why uncover the grave in which the *hatchet* has been buried, and make the air resound with warlike cries? *Let us have peace.* Each man has the inherent right of indulging in whatever abstract notions he may please to entertain as to the origin of the Federal Government and its relations to the States or the people. Naturally I could wish that no one would uphold, what seem to me to be, heretical views, but why consume our time in discussions of the forgotten incidents of a Louisiana occurrence, when our own recent State election has been charged with such features as would cause by comparison the irregularities of the Louisiana Legislature to dwindle into insignificance?

When John Randolph was present in Congress, during the earnest appeals that enthusiastic congressmen were making in behalf of the suffering Greeks, he exclaimed, referring to existing abuses in Washington, "*the Greeks are at our doors.*" If investigations must be made let us attend to the requirements of our own times and our own State, and leave those of the past and other States until we have made our own record clean and free from stain.

I have already said that the constituency I represent here had strong sympathies with the thought that the United States was a nation taking its origin, not from the States, but from the people themselves, and I find that such an idea prevailed in old Frederick County, even before the adoption of the Declaration of Independence itself. From the first when a determination to throw off allegiance to Great Britain had entered the breasts of the old citizens of that County, their thoughts and plans were all based upon the hypothesis of an action of *the people* of the Colonies, and not of the Colonies as units in such action. And hence I find that the old County resolves, June 17, 1776, when the State Convention was hesitating as to the grand step of separation; I find, sir, that she resolves, under these circumstances.

"That what may be recommended by a majority of the Congress, equally delegated by *the people of the United Colonies*, we will, at the hazard of our lives and fortunes, support and maintain, and that every resolution of the (State) Convention tending to seperate this province from a majority of the colonies, without the consent of the people, is destructive to our internal safety, and big with public ruin."

And her utterance was then looked upon as a type of the feelings in other Counties, since we are told that Mr. Samuel Chase, on the 21st of June, 1776, wrote to John Adams, "be assured Frederick speaks the sense of many Counties."

From the very first, the idea was to base action upon the will of the people, who were to be the units, and not upon the States, and this idea has grown and developed until my good old County clings to the national idea with a patriotic warmth, a fervent zeal exceeded nowheres in our land. Her sons are taught by their sires that the national Constitution was the production of the people in their sovereign capacity, and not the result of a compact between States, which may be strong to day and feeble to-morrow, but at all times subject to the whim or caprice of any one of its so-called constituent parts. Trained under such teachings and living with such a people, I could not consent to endorse the political heresies contained in these resolutions.

Mr. President, with thanks for attention, I enter an earnest protest against the Joint Resolutions, with the ardent hope that they may not receive at the hands of the Senate the requisite constitutional majority.

ANNUAL ORATION

BEFORE THE

Medical and Chirurgical Faculty

OF THE

STATE OF MARYLAND,

April, 1874.

By Hon. LEWIS H. STEINER, M. D.

Of Frederick City, Md.

BALTIMORE:
INNES & COMPANY, PRINTERS AND BINDERS.
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ANNUAL ORATION.

THE CHARACTER OF THE MODEL PHYSICIAN.

BY

HON. LEWIS H. STEINER, M. D.

Of Frederick, Md.

Had I consulted my own feelings I should have declined your very kind invitation to address you on the present occasion. It found me immersed in legislative business of a kind not congenial to the preparation of anything of a professional character worthy of your attention, and surrounded by questions that forbade that calm and considerate treatment of a scientific subject demanded of one who should attempt to address those who are brought by their daily experience in contact with the practical results of the researches of modern science. My pursuits, for some years past, have also made me more familiar with scientific theories than with their practical applications. But the urgent entreaty of my friend, your President, and the recognition of the right of the State Faculty to impose duties upon its members, have induced me to accept the honor and undertake the task that it involves, with the thought to encourage me that your kindness has been so marked in the past as to justify me in believing that it will be extended towards any failure I may make in the present.

An amiable English author, whose claim to be a poet was prematurely recognised by his age and then universally discarded, but whose aphorisms and proverbial writings will entitle him to a place in the future among the *Dii minores* of English literature, has spoken of authorship in words that we feel can with great truth be applied to the medical profession.

> "I magnify mine office;
> Albeit in much feebleness I hold it thus unworthily.
> For it is to be one of a noble band, the welfare of the world,
> Whose haunt is on the lips of men, whose dwelling is in their hearts,

Who are precious in the retrospect of memory, and walk among the visions of Hope,
Who commune with the good, and call the wisest, brother,—
* * * * * * * *
Doers of illimitable good, gainers of inestimable glory!
* * * * * * * *
The excellent bless them with their prayers, and wicked praise them by their curses."—(*Tupper.*)

Fully impressed with the dignity of the calling that we have espoused, and recognising the responsibilities attached to the same, I ask your attention to some rather desultory thoughts on "*The character of the model Physician.*"

The three so-called learned professions proceed from necessities created by the fall of our first parents. At that time three relations were disturbed by the violation of the divine command, and the three professions took their origin to meet the needs of his fallen condition, and measurably to repair the sad imperfections and defects that necessarily attach to the same. First, and necessarily first from the very nature of the relation with which it is connected, arose the theological profession. The filial relation existing between an obedient son and a kind, beneficent Father had been violently disrupted by the first, great sin, and the ministry of reconciliation was established to meet this great want,—to reclaim fallen man from the spiritual errors into which he had been plunged, to lead him back from the path of sin and folly to that Father's side from which he should never have strayed, to restore him through penitence and faith to the favor and mercy of his great Creator. But such errors and the attendant consequences of "death and all our woes" could not exist without, at the same time, producing a disturbance of man's fraternal relations with his race, since envy, jealousy and fraud, with still greater evils, began at once to produce their ill effects upon human society. Moreover, another consequence was the introduction of disease—that grand perturbating influence upon the healthy play of the multiform functions of the human body, and its malignant culmination of physical death and the absolute disruption of all connection between man and his temporal relations. The profession of law gradually arose to its present form with the view of attempting to control and regulate the disturbance of the relations with our fellow-men, while that of medicine was created to study the nature of health and the causes of disease, with the application of such aids as nature might furnish from her own mysterious treasury for the cure of the latter. They stand side by side on the same platform, both faithful laborers in the cause of fallen humanity; and although the violent storms of misguided prejudice have attacked them both frequently in the course of their history, their mission has, nevertheless, proven to be of so high and exalted a character, that they have withstood all such ungenerous assaults with the calm dignity that always indicates a consciousness of unwavering devotion to a high and holy purpose. Their mission, if not of so dignified a character as that of the clerical profession, has derived its undoubted patent of nobility from the same source,—must continue to have a meaning so long as man shall struggle with sin, disease and death upon the earth,—must receive commendation and praise so long as time shall endure.

Moreover, man, in all ages and under all circumstances, has never been found wanting in respect for practitioners of the healing art. The Indian is taught to look upon his medicine-man as a person separate and distinct from the rest of the tribe, and unhesitatingly submits with dignified deference to his requirements; regards with superstitious awe the directions he gives in cases of disease, and with ready obedience acts in accordance therewith, even humbly prostrating himself in the presence of his incantations as though they were the mysterious rites of a demi-god. The old Greeks and Romans evinced so much veneration for one who had been distinguished for his practical skill in applying his knowledge of the medicinal properties of plants, that they styled him the god of medicine and took delight in paying divine honors to the memory of Æsculapius. Indeed the physician has been always allowed some special privileges by the civil authorities of every people, showing the profound respect entertained for his services and important position in the body politic. This fact alone demonstrates beyond a doubt that the place he occupies is one higher than that of the mere man of business, who seeks by its prosecution to earn for himself wealth and worldly honors. It shows that mankind at heart is always ready to do deference to his calling, and to select some special mode of showing its deferential respect.

The study required by the physician to secure that knowledge which will enable him to minister to the wants of suffering humanity, is neither light nor unattended with annoying difficulties. In order that he may become in fact as well as in name a physician, that *solidum suae facultatis fundamentum teneat*—to use the words of old Paracelsus—his labor must be continuous from the time he adopts his calling until the hour that disease, which he has been fighting against all his life, shall eventually gain a victory over him, and he shall find that there is no exception in his case from the decree pronounced upon fallen humanity.

Let me, on the present occasion, direct your attention to some peculiarities in "the character of the model physician." First among these is the firm, unwearying determination to master, so far as it is attainable by diligent study, the nature of the functions of the human body in health and their perversions under the influence of disease, with the modes by which nature may be assisted to rectify these perversions and to regain its normal condition of health. What does such a determination involve? What kind of knowledge is required as preliminary to the attainment of this end? Here, a wide field extends itself before us,—so large, so attractive that we scarcely know where first to look, what points first to investigate, and how it will be possible for us to secure even a tithe of the knowledge apparently so imperatively necessary to fit one for the task that the physician has voluntarily assumed. But, if somewhat appalled at the first sight, we may be allowed to comfort ourselves with the thought that "what has been done can be done again," and that if we cannot alike cultivate the whole field, we can at least diligently delve in some little nook or corner, and contribute by our own faithful labor and industry to the wealth of knowledge which ha sbeen the result of like labor and like industry from the hosts that have preceded us.

In a rapid glance at the subjects of study properly germane to the profession of medicine, it is not necessary to notice those branches of knowledge that are absolutely necessary to every liberally-educated man. The physician should be a master at least of his own language, and be conversant with those sciences that elucidate the ordinary operations of the natural world. If he be *not,* he will at times find himself compelled to acknowledge his inferiority to the well-trained graduate of our common schools,—to confess his ignorance of subjects with which modern civilization expects every educated man to be more or less acquainted,—and to feel, while blushes mantle his cheeks, that all his professional knowledge is unable to protect him from the irritating sneer and excruciating witticism which are provoked on account of his general ignorance.

As to the peculiar professional branches requiring his attention, the sagacious forethought of the fathers of medicine recognized *four* that might be called the bases or foundations of the educational preparation needed by its cultivators. First, *Anatomy,* the knowledge of the framework or mechanical structure of the human body—the wonderful residence of the lord of creation,—with Physiology, the laws of that vitality which animates the mechanism and metamorphoses it into a living, sentient organism; then Chemistry, the expounder of the nature of the elements forming the body which the vital force invests with activity and beauty; then Materia Medica, or the knowledge of the effects of herbs, minerals and animal productions when brought into contact with the living economy in a state of health or disease; and lastly, the Practice of Medicine, divided now into several branches, the scope of which is to combine and make practical all the knowledge furnished by the others and to bring them to bear effectively upon disease. But all these inosculate so much with other branches of knowledge that we hardly dare say whether any department of human learning is devoid of information, either directly or indirectly, advantageous to our profession. They all gracefully intertwine about the staff of medicine, even as the serpent symbol is represented as wreathed about the staff of Æsculapius. Mutually they contribute to its support, and as the vigorous vitality with which they are endowed pushes forth evergreen leaves and fair and fragrant flowers, they continue to crown the sturdy old staff with perennial beauties that exhale perennial odors.

The natural sciences are as essentially necessary to be studied by the physician as any of the branches specially assigned for his consideration in his student-life. Of course, it is impossible here to set forth the important relations each bears to Medicine, but their importance may be enforced by the thought that, independent of the direct explanations they furnish of many of the physical phenomena of life, it must be self-evident that man, brought into hourly contact with the various agencies which nature employs in carrying out her own grand plans, is liable to be affected by these agencies in ten thousand ways; that heat and the winds and the rain, the changes of the atmosphere and the seasons,—that the potent chemical influences of decay and decomposition,—that these must accelerate the healthy flow of blood through the arteries, or retard, with a morbid or lethargic tendency, the current of vitality. And if so, should not the physician be ready to avail himself, wherever possible, of the useful assistance of the agencies that tend to the establishment of a high degree of health, and to guard against those that engender disease?

But even to these studies his task is not limited. His attention must be directed to the laws and operations of the mind, and the relations which the latter bears to the body. Mental Science must by no means be overlooked. The physician is often called upon to "minister to the diseased mind," and its laws are therefore to be made a special object of study. An overtasked brain often breaks down under the labor that has been piled upon it. The whims and caprices of the monomaniac require as judicious treatment as his bodily ailments; the imaginary ills and sufferings of the confirmed lunatic demand especial care at the hands of his medical attendant. If he is ignorant, his mode of treatment may convert the harmless monomaniac into the raving lunatic, and may render a paroxysm of lunacy the precursor of life-long dethronement of reason when judicious treatment could have possibly restored reason to its seat in the disordered brain. And in this way the laws of mental science can be made directly available in the regular treatment of mental diseases that frequently demand attention from the Profession. But in addition to this, the importance of a knowledge of the laws of thought is always shown when disease appears in a novel and unexpected form. Then one must reason on the natural phenomena it presents so as to find out, if possible, the cause from the effects it has produced, and then to demonstrate the inevitability of these effects from such a given cause. In doing this, he requires a much more thorough acquaintance with the laws that control analogies than the lawyer, although the latter has the advantage of showing to a larger number, in open court, with all the aid of elegant rhetoric and careful elocution, such mastery as he may have acquired of his subject, and thus to receive the comforting assurance of success from a listening audience. The Lawyer has the authorities of the past and the decisions of the highest courts to guide him in the formation of his opinions; while the Physician is limited to the aid of a few principles and laws, and must apply them to the case under consideration, mostly without the aid of his professional brethren, without the possibility often of referring to the scientific authorities in his library when the emergency demands instant attention. Mankind are most apt to forget that the latter has all this to do as his daily task, and that if he be not prepared for it, emergencies will arise when he will show how palpably unfit he is to observe facts, to interpret phenomena, and to generalize upon their nature and significance.

The old idea of assigning a lower order of intellectual attainments to the medical profession than to that of law, is happily fast dying out. These attainments are not employed in a manner that will produce as much éclat, when successful, but they are none the less imperatively demanded. It will not answer to support this old idea by the assertion that many of the profession, whose practice has been eminently successful, have been men of ordinary abilities and of moderate cultivation. Such solitary instances do not militate against the general law, but only show that natural genius may overcome the most perplexing obstacles. The duties of the physician require him notto address a udiences capable of appreciating his logic, but to meet the attacks of disease; the arguments he is called upon to use are employed at the forum of personal judgment, and not at that of public opinion. Should he pander to this he may receive commendation unworthily, but he will not prove in that way that he is better fitted for his duties than his brother who employs far greater natural and acquired talents in the regular duties of his profession, without proclaiming his merits from the hill-top, so that all the world may hear him. The range of knowledge he needs is more extensive than that required by the lawyer, the amount of application required to master it is far greater, and the assistance of deduction and generalization is more frequently and imperatively demanded. But to the one belong the triumph of the forum, the cheering plaudits of the hustings, and the tickling honors of place and preferment; while to the other, the quiet consciousness of having brought relief in suffering, the grateful thanks of the invalid and the unceasing gratitude of obliged friends. And yet, so far as actual *permanence* of success is concerned, the lawyer is more rarely successful than the physician. His reputation may be more prominent and pronounced at home, but rarely is it recognised beyond the geographical limits of his own land. In this particular we find that Fame, when she does take a medical man by the hand, spreads his reputation over a much wider sphere than that secured by his brother of the legal profession. A comparison of the names of the physicians and lawyers of our country, who are familiarly known and appreciated in Europe at the present day, would, I take it, show a much larger proportion of the former have attained permanent and undying reputation.

But I find that I am indulging in a digression from my theme, and I must resist the temptation to continue. The two professions have each a noble aim, and it is an ungenerous spirit that would attempt the elevation of either at the expense of the other. Let us learn to consider them as worthy of our highest regard, on account of the missions they have respectively to perform on earth, and the noble self-denial that animates their faithful followers.

Let us now pass on from the consideration of this first element in the character of the model physician — the determination to acquire the necessary professional knowledge,— to some others of indispensable importance to success in his calling. Some one may say, "You have surely included everything necessary to his character, when you mention 'the determination and ability to acquire professional knowledge.'" And so I have, if knowledge of professional subjects were all. But, to practise his profession with success, to receive that confidence from the community which will enable him to employ this knowledge, other qualifications of prime importance are to be considered. Of what avail is all the knowledge a man may have acquired, if he is unable to apply it in the time of need? As devoid of practical utility as the ore in its native bed before the talent and industry of man have subjected it to the processes that give it a commercial or utilitarian value to the world! Hence, the second element in the character of the model physician must undoubtedly be the ability to understand and apply the knowledge he has acquired of his profession; its applications, as already intimated, must be made on the instant, and the practitioner must show himself prepared for the emergency. This certainly presupposes a well-trained mind, accustomed to recognise the analogies that exist between present disease and recorded descriptions,—between symptoms urgently demanding immediate relief and such as have been previously treated in a certain definite way, accustomed to bring knowledge of principles to bear directly on the practice of his profession. Wherever such a mind exists, there will be found a successful physician. This is proven on an examination of the results of the treatment of disease by different nations. Those which are most eminently practical, having their knowledge at the same time based upon sound theory, are always most successful in the treatment of disease. The Frenchman delights mostly in the attainment of an accurate diagnosis, the German chiefly in investigations into the origin and cause of disease, the Englishman mainly in treating his patients in accordance with a semi-empirical routine; while the American unites the peculiarities of the three, because his habit leads him not only to secure an accurate diagnosis, to find out its real origin or cause, and to adopt an empirical mode of treating the same, but to grasp the whole subject — to extract all the information that may have been aggregated in reference to it, and more particularly to find out the exact practical value of such information. He is eminently practical. Knowledge is drawn forth by him from the quiet storehouse of the brain, made to assume the habiliments of the present, and to be of practical utility for his fellow-man. Solomon in proverbial terseness says, "With all thy getting get understanding." This is nowhere more imperatively demanded than in the making-up of the character of the physician. Wisdom may be the principal thing, but without the ability to employ this wisdom practically, a man is merely a laughing-stock and source of amusement to those around him. The student, whose days have been spent in a cloister, when he appears in the world is at once recognised by his ignorance of the customs and usages of social life; and the physician who is unable to apply readily the knowledge that he has acquired by previous study, will soon gain an unenviable reputation for indecision and vacillation that will inevitably destroy all hopes of professional success.

These two elements are all that are necessary to make up the abstract idea of a true physician; but to be eminently successful there are several others almost as indispensably necessary. A man cannot attain success, although he may possess all the knowledge the world affords, combined with a ready ability to apply the same in every case coming before him, if his fellow-men cannot be induced to recognise these qualities in him, associated with others, at the same time, which will so elicit their respect and confidence that they will be ready to employ his services and cheerfully award him proper remuneration. His moral character must be more than a mere blank sheet on which his associates can write whatever may please them. It must have some positive, fixed, well-defined and pronounced shape, before the public will repose that implicit confidence which the medical profession should always possess when their services are needed. Hence, although we do not advise a man "to affect virtues if he has them not," yet it may be declared with emphasis, that true and permanent success can only be attained by those whose principles will stand the test when tried by the standard of morality. They are possible possessions for every one, and within the reach of him who strives for their attainment. Respect must necessarily precede confidence. We can never trust those for whom we have no respect. Life itself is, at best, but one continuous warfare with a nature inclined to do evil. Those who come off victors in such a warfare command respect and confidence from their fellow-men. Tennyson has well said—

"Life is not as idle ore,
But iron dug from central gloom,
And heated hot with burning fears;
And dipped in baths of hissing tears,
And battered with the shocks of doom
To shape and use. Arise and fly
The reeling faun, the sensual feast;
Move upward, working out the beast,
And let the ape and tiger die."

Virtue brings its own reward, but it also brings a rich and bounteous reward to the skilled physician in the enlargement of his visiting list. Much injury has doubtless been done to the junior members of the profession by the traditionary accounts of the vices of some of its seniors, since by their frequent repetition the fallacious conclusion may have been arrived at that these vices formed no obstacle in the way of their success, while in fact that success may have been only faintly approximate to what it would have been had these shocking deformities been removed from their characters. Vices have been thus gilded over, so to speak, with the successes of those whose characters they disgraced; but the mask is really so thin that it fails to conceal entirely the shocking ugliness of the vices it covers, and can readily be stripped off by those who wish to detect their real character.

The Code of Ethics adopted by the American Medical Association declares, in an apothegmatic manner, "that no scientific attainments can compensate for the want of correct and moral principles," and we rejoice to find such an apothegm thus publicly endorsed by the collected wisdom of the profession of the country. With the influence that such principles guarantee to a physician, he can attain a proud position, indeed, among the honored of his land. His patients do not hesitate to unburden to him the secret griefs of a suffering heart, because they know in whom they confide. He thus obtains an advantage over others in the treatment of a large class of diseases dependent upon the potent effects of a suffering spirit upon a frail body, which are incurable by mere physical medicaments.

Conjoined with such a character there is always found moderation in all the luxuries with which nature has so bountifully supplied us. It is necessary that a clear mind should be conjoined to a strong, healthy body; the one is needed to afford the requisite relief in the time of danger, and the other to enable its possessor to meet with promptness the various calls that his duties impose upon him. If the habit of intemperance is acquired, the consequence is a beclouded mind, a besotted intellect, an obtuseness of all the special senses, and an enfeebled and effeminate body, altogether unfitting him for the duties of the profession. There is no room here for the defensive plea that the physician may have hours when he can indulge in frequent potations without injury to himself or his prospects. He has no hours that can be strictly called his own. In entering upon the duties of his profession, he has laid on the altar of the public good all right to devote any part of the day to private gratification; he has been consecrated as a priest in the inner temple of Hygeia, and he must go forth wherever and whenever the claims of suffering humanity demand his assistance. Priestly duties in the temple of this goddess, whose veiled face betokens her modesty, can never harmonize with those required in the worship of the brawling and drunken Bacchus. For though we may agree with Iago that "good wine is a good familiar creature," we must also recognise the full significance of the sober Cassio's remark, when remorse at the conduct of Cassio, when drunk, led him to exclaim: "Every inordinate cup is unblessed, and the ingredient is a devil."

Associated with such moral and temperate (I use the word in its true and original sense) elements, there will always be present in the model physician a determination of will that must give effect and positive value to his acts. A man may have knowledge, the ability to apply it, a character above the reach of suspicion, and yet, if he lacks this peculiar source of energy he will not make his mark in the world. It will, when present, give dignity to his station in life, however humble it may be; it will bring honor to his name wherever it may be known. The answer given by the Grecian Demosthenes to the question "What constitutes eloquence," was "*Action*"; and to the question even when thrice repeated the same answer was thrice returned. And a similar demand in regard to the quality which will fit the physician for success, after he has attained the requisite intellectual and moral armor for the battle he is expected to fight, may be met with a like answer. Unless the physician has energy—energy of purpose, which is the same thing with determination of will—he will be devoid of the strongest and most essential prerequisite to positive success. He requires not the action of the forum or the legislative hall, but that calm and dignified and untiring energy that springs from a consciousness of knowledge, a proper recognition of the value of moral character, and a determination to meet the requirements of his profession as a solemn duty.

In order to show the possession of such energy he need not feel himself impelled to attack violently every form of error that manifests its presence, whether insidiously or openly, in a community—to take up the cudgel and boldly attack every form of quackery that obtrudes itself upon the notice of the people. But, on the other hand, to show by his own better qualifications how much superior to error is that true worth which invites scrutiny of every act and every thought; not compromising the honors and privileges of his profession by dallying with the meretricious attractions of error; and to show by fixedness of purpose and unwavering devotion to truth and unflinching energy that there is such a thing in the world as true worth, which may challenge the admiration of every one for its tenacity of purpose. This tenacity or energy of purpose always invests a man's character with a halo of beauty undimmed by increasing years, growing brighter as the close of life draws on, until even the cold damps of death fail to dim its lustre. Memory treasures it up among the other qualities that form the distinguishing traits of those whose names never die.

Towards the members of his profession as well as his patients, such an one will never affect the rude and uncouth manners, the *brusquerie* that has sullied the reputation of some of the distinguished names of the past. In truth, from whom should a kind gentleness of manner, a sympathizing disposition, and a heart brimful of philanthropy be more expected than from the physician? What is his office? Follow him to the chamber of sickness. The poor sufferer is lying in the agonies of a burning fever, the nervous system is strained under the effects of acute pain to its greatest possible tension, so that even ordinary sounds become almost unendurable; friends are standing with sorrow-laden faces around his bed, breathless with anxiety, and eager to grasp any suggestion that may be offered for the alleviation of the pain and suffering of the dear one; a fond father, with a heart overburdened with grief at the thought that a dear son may be snatched from his arms, and the bright chaplet that fame has already placed on his youthful brow may be ruthlessly torn off by the great despoiler; a doting mother, whose very existence seems to be bound up with that of the sufferer, and whose very heart's blood seems passing away as she notes the increasing agony of her son, and the speedy approach of the sad moment when a mother's love—one of the greatest boons heaven has given to man—shall be deprived of its idol; the weeping sisters and brothers, who now begin to realize how inexpressibly dear the companion of their childhood has been to them; perhaps a wife, who has but recently said with joyous earnestness, "Entreat me not to leave thee or to return from following after thee; for whither thou goest, I will go; and where thou lodgest, I will lodge: where thou diest, will I die, and there will I be buried," and who now sincerely wishes to bear a part of his pains, or, if the last hour be at hand, to share its agony with him. Picture such a scene. The world is full of them. Every second marked by the vibrations of Time's mighty pendulum witnesses one; and though the curtain drops to conceal the sad details, it is but to rise again on another and another, until the history of mankind seems to be but one continued, uninterrupted series of suffering and death of those who have acted in the earnest drama of life.

Let us now picture, amid this anguish of body and spirit, Hope appearing, with a countenance irradiant with peaceful smiles, and gently whispering that "all is not over," that the agonizing separation may yet be prevented. Patient and friends are buoyed up by the gentle sound; even a straw holds out some prospect of relief to a drowning man. The model physician enters the chamber of suffering, and his every look, word and action have their influence upon the friends there assembled. Suppose that he is not gifted with that sympathetic spirit which manifests its presence in the courteous, soothing tone of voice, the gentle touch, the kindly-beaming eye of pity, and benevolent expression of face,—his science may learnedly explain the nature, and perchance clearly define the cause of the disease,—may indicate the agents that will assist nature to regain the equilibrium of health, but it calls not forth the confidence and trust which, combined with gratitude, may be lurking in the bosoms of the weeping friends and waiting for opportunity to clothe themselves in words, and even the low whisper of Hope is hushed by the harsh and crabbed opinion or advice he utters. But on the other hand, suppose him possessed of such qualities of spirit, they seem to act like magical charms on the patient. His pain is mitigated by the sympathy that is expressed in the medical man's face if not in his words, and his friends are still more buoyed up by the hope enkindled within their breasts. Never did Demosthenes, or any other orator of ancient or modern times, keep an audience so spell-bound by the eloquence that fell from his lips, and they listen with breathless anxiety to the words that science aided by sympathy pronounces in reference to the patient. Science is aided by the philanthropy of its votary. The whisper of Hope is swelled into the loud assurance of almost positive certainty that the final separation so dreaded by all will *not* take place. Smiles of quiet joy mingle with tears of sympathetic grief, and hearts are relieved of their burden of sadness. The physician leaves that chamber with the blessings of heaven invoked upon his head by all its inmates. O speak not of the triumphant success of the soldier, whose victory brings desolation and death to the fireside and unutterable sorrow to the family circle; but give expression, if you can, to the triumph of the priest of nature, who, with all the mental and moral qualifications that make up the character of the physician, in addition possesses those that mark the gentleman. May I not apply to him those rapturous encomiums which Tennyson employs in his loving tribute to his friend Hallam?—

> "He
> To whom a thousand memories call,
> Not being less but more than all
> The gentleman he seemed to be,
> So wore his outward best, and joined
> Each office of the social hour
> To noble manners as the flower
> And native growth of noble mind:
> Nor ever narrowness or spite,
> Or villain fancy fleeting by,
> Drew in the expression of an eye,
> Where God and nature met in light.
> And thus he bore without abuse
> The grand old name of gentleman,
> Defamed by every charlatan
> And soiled with all ignoble use."

To attain the success which the model physician richly deserves, he must possess a willingness to respond to every call made upon him for the relief of suffering humanity. He must literally know no rest. The members of the other professions are able to call some hours of the day their own, but he must yield up all freely, if need be, to the demands of the public. Wearied and jaded with the labors of the day, he may seek his bed at night with the hope of there securing the refreshment of a sweet, sound sleep; but too often while it is gently shutting out the world from his senses, the demand is heard at his chamber-door for his services, and he must deny himself that repose which his wearied nature requires, in order to meet this demand —all this, be it recollected, often without the hope of such pecuniary compensation for the loss of rest as might stimulate wearied physical and mental energies to willing activity. Indeed, it most often happens, especially to the young practitioner, that the night-bell is rung for patients in indigent circumstances, whose want of education unfits them to appreciate changes in the disease, and whose fears cause them to interpret almost any change as unfavorable. The educated man has some little ability to judge, in a general way, of such changes, and he hesitates to call upon his physician in the night unless impelled by what he deems an urgent necessity. Hence, I say, the hope of pecuniary reward is rarely the stimulating motive urging prompt and careful attention to such calls; there is a higher and better motive. Indeed, as regards pecuniary motives, there is no calling in which these hold out more inducements for its followers to desert the straight path of strict professional honesty than that of medicine. With all his disposition to devote with unflagging zeal time and talent, day and night, over and over again unrewarded and unthanked, the Doctor finds the world too much addicted to recognize the pretensions of the mere quack, and to freely pour into his pocket hard-earned money. Knowledge combined with honesty and virtue are often not so productive of *present* reward as pretentious ignorance, even when accompanied with the illy-concealed hideousness of vice. Hence many, desiring rather the ephemeral notoriety that attaches itself to brawling pretensions, have deserted the paths of strict professional honor and propriety, and have devoted themselves to the idols of the world, that is, have become cultivators of the mean trickeries of quackery. To use the words of Job, "they are no true physicians, but forgers of lies." Some in our own country have even deserted their professorial chairs, sullied the robes with which they have been endued by colleges, and have pandered to the ways of quackery in the community with the view of amassing fortunes. An English writer truly remarks, that "the folly of the ignorant among the public opens many a profitable path to meanness. Worldly advantages are most freely offered to all medical men who will be humbugs, and some surely must be too weak to withstand temptation of this kind." When the gilded bait is seen floating on the waters above them, there will always be silly fish unable to resist its temptation.

The demands upon time and physical and mental energies are, as I have said, by no means properly remunerative, especially to the junior practitioner. Nay, more frequently he meets murmurs and complaints, from the ignorant and querulous, that he is not more attentive to their wants and more disposed to sacrifice everything for their comfort. These are, however, to be expected from the ignorant. Suspicion that they are neglected naturally creeps into their minds, and a want of the finer feelings of the human heart keeps them from concealing such suspicion. "Be thou as chaste as ice, as pure as snow, thou shalt not escape calumny."

But the true lover of his profession will not suffer detraction to worry him; he will pursue the even tenor of his way, knowing that "it is wisdom to follow right in the scorn of consequence." Years, as they roll along, will bring his good qualities and real merits more and more prominently before the community. Respect and honor will be awarded him as a right, and the careful attention he has paid to the wants of the poor will eventually attract the notice of the rich, and bring him an enduring and permanent reward for past troubles and past labor.

The physician must learn to have patience, in the firm belief that the old adage—virtue crowns those honoring her—will verify itself in his own case.

"Patience! why, 'tis the soul of peace.
Of all the virtues 'tis nearest kin to heaven.
It makes men like to gods. The best of men,
Who e'er wore earth about Him, was a Sufferer;
An humble, patient, meek, and quiet spirit;
The first true gentleman that ever breathed."

Under the gentle influence of patience he will do the right and bear the wrong, waiting the unfailing reward of those who fight a good fight. As life draws to a close, his hours will not only be sweetened by the recollection of varied duties honestly undertaken and faithfully performed to the best of his ability, but the friends he has gathered in his journey will strew his pathway to the grave with the most fragrant flowers that affection and love can gather. Parents will welcome him to their fireside as an old and tried friend; children will enjoy the privilege of listening to the familiar tones of his voice, and count his kindly smiles as rich rewards. He has fought the good fight of the true hero, and the richly-earned chaplet now adorns his brow. If he has added to the qualities already enumerated, the gentler but still more noble graces of a Christian life based upon a Christian faith, still higher and inexpressibly greater rewards will be his when earth shall close upon his eyes. At the annual commencement of his college the diploma certified that he had performed the full measure of a student's duties; but at the commencement of a still higher and more joyous period of his existence, the quintessence of his happiness will consist in the welcome words of his Master: "Well done, good and faithful servant." May this reward be yours and mine when life's fitful career is ended, and the scenes of another world open before our eyes.

OUR DUTY:

To acquit ourselves like men in the battle of life.

AN ADDRESS

DELIVERED AT

THE SECOND ANNUAL MEETING

OF

The Maryland College of Pharmacy,

(March 14th, 1872.)

BY

LEWIS H. STEINER, M. D.

PUBLISHED BY THE COLLEGE.

BALTIMORE:
WM. K. BOYLE & SON'S STEAM PRESS.
1872.

ADDRESS.

GENTLEMEN OF THE MARYLAND COLLEGE OF PHARMACY :—

Your invitation to address you to-night assumed the form of a command that I dared not disobey, when memory brought before me the many happy days I had spent as a member of the Faculty of your College ; when I thought of the anxious hours spent with you in perfecting its organization and laying the foundations of that which has since taken rank as one of the first Pharmaceutical Institutions in the country ; when I pictured to myself the bright, ruddy cheeks and sparkling eyes of the small band of youths who constituted the first matriculants of the College, some of whom are now so immersed in the cares of business and the stern duties of life that care-worn brows and sorrow-burdened faces show they have tasted of the labor and sorrow which is the lot of man here to undergo ; and more particularly urgent was the invitation when I thought of the kindly smile and beaming eyes, the form so radiant with manly beauty, of that colleague who was stricken down by fell disease when life was just opening before him in its most attractive and charming form. Notwithstanding the absorbing character of the duties of a position, novel and untried to me before this winter, I felt compelled I say, to accept your invitation and to appear before you to-night.

And now, my friends, while the memories of the past are so sweet and so abundant, while the ties that bind the College and its members to the speaker are so strong and so enduring, while it is good for us to be together once more as fellow-laborers for the public good,—what shall be the burden of the message that I bring to you, what the words of encouragement and advice for the future? It would be idle for us to refer to the past, unless we should here take high resolve for the future, and make our re-union a starting point for something better and grander than we have heretofore attained. We have all to do battle against ignorance and the brutalizing influence of self and selfish considerations. We have all the duty resting upon us—"to fear God and serve the King"—to love our Maker and to obey the laws of the government under which we live. It may not then be amiss, if my them ebe for this night, "*Acquit yourselves like men in the battle of life.*" If I shall be enabled to present this to your minds as the one thing really worthy of man's ambition, we shall not have met in vain, and the memory of this night, in after years, will be dear and precious to all our hearts.

Life is a battle in more senses than one. In animal life we have a constant struggle against disintegration and decay and death. Every vital act is attended with a destruction of some portion of the living organism; every breath we draw is associated with a chemical action that reduces some portion of the organic matter of our bodies to less complicated and simpler forms, which show the potent agency of chemistry; every effort we make, whether muscular or cerebral, is attended with chemical changes either of muscle or brain structure. Were there not present a superintending agency that controls and holds in check these changes, the result would be utter destruction of that organic whole which we know as man. But the mysterious principle baffles this destructive tendency, converts the material introduced from without into reparative tissue, and keeps the system in healthy, vigorous action. If this be so in health, how much more so must it be when disease presents itself? The battle then becomes more active. The seeds of disease are introduced into the organism, and being by their very nature the enemies of life, the system must use redoubled energy to expel them in some form or other. Thus we have sickness, in its Protean form, tending to the entire overthrow of that fine play of action and re-action which constitutes health. Medicines are introduced to aid in this battle, to regulate or give force to the powers of life, and to aid in the utter route of the hostile powers. In mental life another species of battle is to be fought. Here the God-given impulse, to acquire knowledge, so that we can subdue the forces of nature and compel them to bend to our will and aid us in our longings after improvement, comes into play. The battle is with ignorance and its brutalizing, down-dragging tendencies. The battle is one imposed upon us by the very command of God that man should "replenish the earth and subdue it, that he should have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth." To arm man for this contest he has the accumulated knowledge of centuries locked up in books that yield their contents to the student's demand, and the wonderful faculty of thought which enables him to appropriate what others have done, and to use it as a foundation for larger and more comprehensive results. Again, in the spiritual world, another and still more important battle presents itself. The powers of spiritual darkness are constantly threatening the overthrow of him who was originally made in the likeness of his *Creator*. This battle would inevitably result in the success of these powers, were we not supplied with aid and assistance, at all times within call, which will ensure triumph and glorious victory to him who invokes it, and honestly and faithfully labors to secure freedom from the slavery of sin and spiritual death. But apart from these inevitable contests, there is the battle for success in life, which brings one into contact with his brother man and produces either that honest rivalry which delights in fair competition, whatever be the result, or that dishonest strife where fraud and deceit contend for the mastery. Here we have mind brought into contact with mind, and all the faculties that separate man from the animal find an appropriate sphere for their play. Here we find the arena upon which accumulated stores of knowledge and hard-earned experience are made to bear rich, practical fruit. Here it becomes us to acquit ourselves like *men* with a high aim before us.

And what a world of meaning is there not connected with the word man? I do *not* say "*gentleman*," for that grand old word has been so demeaned and degraded by the uses to which it has been applied that it no longer brings up much attraction for those ambitious of eminence and renown. The gentleman has ceased to be a *gentle* man, one possessed of all that ennobles and dignifies, conjoined with a gentleness of character that allures by its attractive sweetness,—one who conjoins the elements of native and acquired strength with these lovely attractions which spring from beauty of disposition and earnestness of purpose. At one time such a man was the dispenser of laws and the representative of the spirit of the age. He was the arbiter of all that constituted the accepted and recognized customs or fashions of the day, *because* his eminent, inherent worth made him the really worthy man of the age. Times have changed, and the gentleman is too often only distinguished for his worthlessness in other regards, while his claims to be the director of fashion are considered as of paramount importance. The term as used at present is too often meaningless, and therefore the subject of my address is that we should acquit ourselves as *men*. Man was made in the likeness of the Deity. He was made a little lower than the angels, and yet his form and his entire being were elevated immeasurably higher than theirs, in that Deity assumed the same when He dwelt among us. To acquit ourselves like *men* in the battle of life is to be just what we were created to be, cultivators of all that is beautiful and lovely; students of nature, her wonderful productions and the laws that underlay them; masters of the profound secrets of the natural world and kind guardians of those humbler beings that are placed under our rule and dominion; enemies—implacable enemies of all that is mean, low, sensual, selfish, devilish; sound haters of vice in all its Protean forms, no matter how meretriciously attractive the garb she may assume; earnest, faithful cultivators of the good, the beautiful and the true; humble, obedient followers of Him who leads the way through the devious windings of the world, ever onward and upward to that home prepared for those who shall be pronounced good and faithful servants. Such are the members of our race whose names are written, not always, nay rather rarely, upon the bright record of fame amid those whose vaulting ambition gave them the rank of notoriety, but whose names are recorded upon those other pages of that eternal record, which shall be opened up for examination when the shows and deceits of this world shall disappear like the morning dew before the splendor of the rising sun.

Our subject has regard to our personal relations to the community, and these only can be properly established when we are true to ourselves and the moral obligations resting upon us as men. The age is one in which a proclivity to self and selfish aggrandizement occupies a prominence that bids fair to overshadow and conceal all that is manly and right. It is a money-making age, and to get money, honestly if possible, if not, to get money at all events, seems to be the motto emblazoned upon every one's banner. Hence fraud and deceit have become so common that the old virtues of frankness and sincerity have ceased to be either popular or common. That which will give great success and notoriety is grasped after, while the eternal principles of right and justice are looked upon with a distrust and suspicion, mortifying to him who has sufficient honesty of purpose to accept them as the guiding motives of his life. The present success is considered as worth more than the future and eternal triumph which must, in the long run, attend the course of the honest and truthful man. In the name of honor and truth and genuine manliness, I protest against all this, and abjure you to renounce all such fictitious success, and to cultivate in its stead that moral honesty and high principle which is laid down by the Founder of the Christian Religion as alone worthy of the ambition of men. In the name of all that is good and virtuous, and alone deserving of your entire energies, I implore you to cling to those principles that will make your lives a continuous series of bright examples of the worth of truth and honesty.

Would you see the man whose fame rests upon a sound and enduring basis, against which calumny and foul-mouthed slander may cast their darts without ever affecting its perpetuity? He is gentle and respectful to those whom age or official position place above him; keenly alive to the suffering and afflicted wherever found, with a hand ever ready to lend to the needy; modest as to his own acquirements or attainments; ready to defer to those whose experience or more extensive opportunities entitle them to respectful consideration; anxious to probe to the very bottom every subject requiring his attention; a lover of truth who shuns a lie as a source of moral contagion, to be avoided with more anxiety than a virulent physical disease; one whose honor drives him to avoid all that is base and low as beneath the dignity and grandeur of human nature; attentive to all his duties and obligations as though they had been assumed under the solemnity of an oath; a respecter of female virtue, because he loves the sex of his mother, sister or wife, and spurns all that would tend to cast the slightest shadow of a spot upon it; a lover of his fellow-men *as men*—fellow laborers in a common work—fellow-soldiers under the same flag, with a common purpose, and fighting for the same glorious cause. Be *such* men in the battle of life, and you can lie down at night with the consciousness of well-spent days, and sleep the sleep of the just and good—it will matter little, whether your assessment return upon the tax books be great or little, whether you be numbered among the millionaires of this land, or be so poor as to provoke the sneer of scorn from the wealthy or the proud, only be like such an one and you will acquit yourselves like men in the battle of life. It will matter little, whether your name be enrolled with those whom accident or fortune has made conspicuous before their fellow-men, but the good name that springs from a good life will endure when all the ephemeral glories of mere temporal success shall vanish before the resplendent light of the great sun of truth.

"Be a *good* man," was the dying injunction of one of the great lights of literature to his sorrowing son-in-law, and in it there was concentrated a mine of wisdom, a volume of advice. They are only truly great who are really *good*. Clad in such panoply you are fitted for any struggle with the powers of earth, air and darkness. The shafts of envy, malice and craftiness ever fail to find a vulnerable spot in such armor,—they fall harmless at the feet of their intended victim, or, like the boomerang of the East return to inflict a wound upon the hand that has hurled them. Be a good man in the struggle of life, and a magic circle is inscribed around you, within whose precincts not a serpent of malignity will ever dare to crawl with its malignant, venomous hiss. Be a good man, and the good of this world will rise up and call you blessed,—your days will be crowned with fruits meet for a better world, and their close shall be gilded with a lustre brighter far than that which comes from worldly honors.

But each of us has obligations arising from our respective callings, which also claim that we should "acquit ourselves like men in the battle of life." You meet here to-night as members of a trade and a profession, honorable among men and worthy of the respect of the community in which your lot has been cast. You have considered it right to band yourselves together for common protection, believing that "*in union is strength*," and that a common foe demands at your hands a united front and such united efforts as will ensure success. The progress of knowledge has removed the science of medicine from the field of charlatanry, and placed it high among those subjects that claim the respectful consideration and the high esteem of mankind. It has come forth from the dark dens of superstition and spread its truths before the world, asking that they shall only live when they can bear the sternest scrutiny. It has ceased to love mystery and to enshroud itself in magical charms and dark incantations—It has given up claims upon public regard based alone upon ignorance as to its processes. But now it challenges respect for its earnest investigation into the secrets of physiology and the perverse actions of pathology, for its diligent search into the hidden nature of disease and the secret powers of those agents in the inorganic, and organic kingdom that enable the human system to eliminate morbific matter or to regain that beautiful play of vital energies, which we call health. It has ceased to be quackery, and challenges regard because it lays claims to be considered a science.

In the onward progress, however, of medicine, its cultivators have been obliged to call in the aid of others to assist them in the vast field which research has opened up to their labors. They have transferred to the Pharmacist the whole business of obtaining the *materia medica* from the storehouses of nature, of freeing these from extraneous and inert admixtures, and preparing them in such forms as best adapt them for use as remedial agents. The Pharmacist has become the necessary assistant to the Doctor, and the latter's success as a practitioner depends largely upon the intelligence and honest fidelity of the former. He has freed himself from the odium of being a mere vendor of simples and a trader in quack remedies, and attained the proud position of a man of science ; in a somewhat humbler sphere than the physician, laboring for the relief of humanity from the physical effects of the fall, but still a member of an honorable and a dignified profession.

As such, the injunction also rests upon you to acquit yourselves like *men* in the battle of life. You can prostitute your calling so as to make it a by-word and a reproach. You can take advantage of the public by dispensing worthless drugs and inert preparations. You can endanger public life by allowing ignorance to preside over your stores, and to have charge of the dispensing of the medicines which they contain. You can imperil the health and lives of the weak and feeble, by furnishing them with dangerous nostrums and deadly drugs; or by dealing out those that are worthless, you can deny to suffering human nature the agents that may enable it to overcome the dangerous effects of disease. And, on the other hand, you can show yourselves worthy of the confidence reposed in you by the physician when he calls in your aid to send from your arsenals the ammunition he needs for his contest with disease,—you can show yourselves worthy of the faith that the father or husband has in you when, without doubt or hesitation, he accepts from your hands the agents that the physician prescribes for the beloved members of his household. You can build up for yourselves reputations that neither calumny nor rivalry can shake, but which will be a legacy of priceless value to your descendants. You can fight the battle of duty in your calling full as well as it can be fought in any position of life. Your character as men demands this of you. To rob your neighbor by breaking into his house by night, or by filching his pocket book is a crime that is revolting to your sense of right; but the crime is really greater where impure or inert drugs are dispensed in the shop of the pharmaceutist. The simple, honest, confiding ignorance of the public is thus shamefully trifled with, and the conscience of the dealer, being seared as regards minor violations of the moral law, becomes less and less sensitive to greater and grosser violations of truth and honesty. The human soul may indeed become so averse to the performance of right *because it is right*, that the fear of detection will be the only measure of the amount of wrong it may commit. "The fear o' hell's the hangman's whip to haud the wretch in order," and where no better motive can be made effective than this, we must be content with its presence, but such a motive is the lowest that can influence man. Strive then to resist any temptation to be dishonest in your profession, because by so doing you will do an irreparable wrong to your character as men.

Your character professionally also impels you to fight this battle. Having once entered the ranks of any employment we must not only strive to possess ourselves of all that is already known, but must labor to extend the boundaries of that knowledge and to swell the aggregate of the treasury which experience and research have conjointly gathered together. Stagnation is impossible without deterioration. Not to go forward is to go backward. Progress is the law of organic life, and is the law of successful prosecution of every human pursuit. Occasionally the anomaly may present itself of a nation living upon the traditions of the past, and only marked by high development of the imitative faculty, as is the case with China. Such a nation, however, does not occupy the forefront of civilization, but only lingers upon the outskirts of barbarity. It has no prevailing influence upon its sister nations,—and but answers the purpose of a guide-post to warn others of the dangerous position it occupies. How can you rest satisfied with such a Chinese fate? The whole range of natural history, physical and chemical science is daily unfolding new truths and greater treasures of knowledge to the faithful student. These contribute to the elevation of your calling in a most marked way. They make *it* more and more indispensable to the practitioner of medicine, and cause *you* to become more indispensable to the community in which you live. Grapple then with the secrets of nature, with an earnestness of purpose and a determination of soul that recognize "in the lexicon of youth reserved for a bright manhood no such word as fail."

I cannot dismiss my subject without referring to the obligations resting upon us as citizens of a nation now in the forefront of civilization. We are not isolated beings, intended to fight the battles of life alone, but constituted to live with our fellow-men in constant contact and intimate association. Man is a social being, gregarious from natural constitution and necessity. He must have government that shall insure the greatest possible protection to its citizens, and allow of the highest possible development of their intellectual and moral faculties. This government may present itself under many different forms, but the highest and most perfect is that which guarantees the greatest good to the greatest number. Such, we are persuaded, is that under which we live, and whose beneficent protection enables you to prosecute your calling in such a manner as to do honor to yourselves and to provide for your families. To keep it free from stain and to secure all its advantages, each one of its citizens must pay more or less attention to the principles upon which it is based, and be specially interested in the men who are selected to take charge of its offices. The American is a native-born politician, and dare not transfer his own obligations in this regard, to any ring or clique. He must personally take an interest in the primary meetings from which emanate those measures that inform the party of which he is a member, and at which the men are selected who are to give character and tone to its enunciation and defense of such measures. The frauds and corruptions that sporadically present themselves in political parties arise from the negligence of good citizens as to the conduct and management of such primary meetings. These are too frequently manipulated by unprincipled tricksters who have nothing but self aggrandizement or self advancement in view. They are manipulated as was Hans Breitman's nomination by Hiram Twie, of whom Leland says:

"Ve haf great hobes
Who hat shange his boledics fifdeen dimes,
Und derefore knew de robes,"

and their candidates are like that same veteran bummer, who seductively stated to his adversaries when canvassing for their votes,

"Dat ve may meed in gommon,
I declare here in dis hall—
Und I shwears mineself to hold to it,
Fotefer may pefall—
Dat any man who gives me his fote—
Votever *his* boledicks pe—
Shall alfays pe regartet
Ash bolidigal friendt py me.
Dese ish de brinciples I holts,
And dose on vitch I run:
Dey ish fixed, firm and immutaple
Ash te course of de 'ternal sun:
Boot if you ton't abbrove of dem,
Blease nodice vot I say—
I shall only pe too happy
To alder dem right afay."

To drive the political trickster from the high position he holds at present in our political parties, to force the office seeker, whose sole delight is the spoils, and whose love of country is an unknown and unknowable quantity, to select men for office whose special fitness for the same will ensure faithful and energetic performance of its duties, to put an end to fraud and corruption,—these are aims worthy of earnest effort on the part of every good citizen. And here is a battle ground upon which it should be your high aim to acquit yourselves like men. Be faithful to your native sense of right, your innate love of truth and justice, and do not be indifferent to the political questions of the day. You can contribute largely to the prosperity and success of your country—to the downfall of vice and lack of principle which always threaten the overthrow of any people, by joining hands with good citizens of all possible employments and fighting the political battles of the day. Do not misunderstand me so far as to suppose I am advocating your attachment to any particular one of the two great political parties; but I do advocate that you attach yourselves to one of them and strive to make it as pure and unselfish and patriotic as possible. The majority is always in danger of becoming corrupt and unreliable; the minority has *another* danger into which it may run, that of rejecting no available means to secure the overthrow of its competitors and its own success.

Keep before you the example of the fathers of our country, who pledged their earthly substance, their lives, their fortunes, their sacred honors, for the cause they had solemnly and conscientiously espoused. Their names shine brighter on the pages of their country's history as years roll along—stars of the first magnitude in the firmament of their country's glory. Historians and poets love to commemorate their deeds, and the aged sire to narrate to his listening children how they lived and fought and even died for their country.

With such examples before you for emulation, live, and act, and, if needs be, die for principle and your beloved land. You will then leave a record of precious worth to your children far more worthy of transmission than countless acres or untold piles of gold.

Gentlemen! need I apologize for presenting you a lay-sermon to-night instead of the didactic lessons which it was once my proud pleasure to expound to you? Need I ask at your hands a pardon for talking of the solemn duties that press upon you every moment of your lives? Need I present an excuse for troubling you at this annual meeting with more serious thoughts than usually constitute the theme of the speaker? I think not. Life is always a serious business,—how we shall live, one of the most important subjects commanding our attention. And at an annual re-union, when friend meets friend to congratulate him upon the past, it is never out of place to say a word for the future. Such reunions are mile-posts in life that mark the end of past effort; but they are also the starting posts of fresh effort, of high resolve, of firm determination. Let this night mark the beginning of such an era in our lives, and no one will regret having participated in the second annual re-union of the members of the College of Pharmacy.

PHYSICAL SCIENCE:

ITS PAST, PRESENT AND FUTURE.

An Address

DELIVERED BEFORE THE

Goethean Literary Society

OF MARSHALL COLLEGE,

AT ITS ANNIVERSARY, AUGUST 28, 1851.

BY LEWIS H. STEINER, A.M., M.D.

GRADUATE MEMBER OF THE SOCIETY.

BOONSBOROUGH, MD.
PRINTED AT THE OFFICE OF THE ODD FELLOW.
1851.

Goethean Hall, August 29, 1851.

Respected Sir,—We, a Committee in behalf of the Goethean Literary Society, would respectfully return to you our sincere thanks for the eloquent and appropriate address delivered before her last evening, and earnestly solicit the additional favor of a copy for publication.

Yours very truly,

GEO. J. ECKERT,
A. G. BANKS,
JOHN O. OGLE,
Committee of the G. L. Society.

Lewis H. Steiner, A. M., M. D.

Mercersburg, August 30, 1851.

Messrs. Geo. J. Eckert, A. G. Banks, John O. Ogle,
Committee of the Goethean Literary Society:

Gentlemen,—Your kind note of the 29th inst., requesting a copy of the address for publication, which I had the pleasure of delivering before your society at its late anniversary, is now before me. My own inclination would lead me to withhold the address, as it was prepared with no reference to publication, but as the Society desires it, whose property it now properly is, I am constrained to yield to its wishes.

Yours, &c.

LEWIS H. STEINER.

ADDRESS.

Gentlemen of the Goethean Literary Society:

Finding myself once more in your midst, selected by your kind preference to address you on this interesting anniversary of your Society—the birth-day of Goethe—Germany's greatest son, a host of recollections connected with the past present themselves before me; and memory contrasts the forms of "the distant and the dead" with those now animated by the genial feelings of youth, who occupy their places, and are pressing on with equal zeal towards the attainment of collegiate honors. The familiar smile and the friendly grasp of the companions of former days are now absent, still I do not feel as a stranger among you,—as we all acknowledge one common Alma Mater, whose honor and character we feel bound to protect, and whose interest we feel bound to further by our own individual exertions. Those that have gone before you are now battling with error in spheres as diversified as the characters of their minds, and in due course of time you will be called upon to enter the arena of life, and to do good service in the cause of the right. On this stage of action you will find that the armor necessary for the conflict has to be modernized to suit the weapons of your adversaries,—that the logical syllogisms of the past, along with the dull abstractions on which they were based, will be swept away by the cavilings of infidelity,—and that a more secure panoply must be prepared to withstand the onward advances of Rationalism. The adversaries of right have endeavored to appropriate to themselves the first buddings of Science, as favoring their own infidel views, and though they have met its friends in past years quaking with fear, lest all they had learned to reverence and adore as sacred should be upturned from its secure foundation by the discoveries of later days, still we have the glorious privilege of seizing the unfoldings of those same buddings, and finding them corroborative of our long cherished Christian opinions. In view of this important branch of your preparation for active life, permit one who has wandered once more into your fold of peace and happiness, after roaming in the world at large, to direct your attention to *Physical Science, its past, present, and future.* And he feels emboldened to select this subject by the recollection that "the great master of German poesy," whose birth-day you now celebrate, "was pervaded by a profound veneration for nature." In the words of one of his earliest friends,* "Who has more eloquently excited his cotemporaries 'to solve the holy problem of the universe,' and to renew the bond which in the dawn of mankind united together philosophy, physics and poetry? Who has drawn others with a more powerful attraction to that land, the home of his intellect, where, as he sings,

> "Ein sanfter Wind vom blauen Himmel weht,
> Die Myrthe still, und hoch der Lorbeer steht."

As all scientific knowledge is based upon an accumulation of the results of real observation, as well as upon pure reasoning on the existence, nature and consequences of certain laws,—the result at one time of judging the effect by the cause, and at another, the cause by the effect,—it seems to be proper at the commencement of this discourse to show the distinction between that merely superficial view which never pierces beneath the outward *form* of nature and degenerates into skepticism, and that deep philosophical view which endeavors to understand the contents as well as the form,—the law as well as its manifestations.

It is the tendency of narrow and contracted views of Physical Phenomena to present certain principles as established when they are merely the results of a series of crude and imperfect observations, and also to prevent that fair and candid examination which true Philosophy will give to every object of thought. This double evil confines the mind within the narrowest limit, and clogs all its heaven-directed energies. It is a dull weight, bearing down to earth every aspiration of Genius, every flight of Fancy, and every deduction of Science. The lover of Truth, with a noble disregard for those errors which have been covered with an invisible veil of sanctity by his fellow-men, strikes boldly into paths untrodden before, and fearlessly investigates the secret causes of the mysteries that surround him. The opinions of his fellow-men on matters of Science are to be respected only so far as they coincide with the facts which his own observation has noticed, and the rational conclusions to which his own mind has arrived. The fear that what he has heretofore deemed an essential portion of his belief, as a Christian, will be injured by converse with Natural Phenomena, is not present to his mind, for he knows that all truth is harmonious, and in its very nature self-supporting. As one fact in Nature presents itself with an apparent contradiction of revealed Truth, he does not deny the latter on account of the seeming inconsistency, knowing that further and more perfect knowledge will enable him to reconcile such apparent contradictions, and to make them both mutually subservient of the same end,—the advancement of Knowledge based upon the eternal principles of Truth. As the Roman Philosopher expressed it,* "Nature has implanted in man a craving after the discovery of truth,—led by this instinct, we learn to love all truth for its own sake; that is to say, whatever is faithful, simple and consistent; while we hold in abhorrence whatever is empty, deceptive or untrue."

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* Humboldt's Cosmos, II, 439

It is this very love for truth which constitutes the grand difference between skepticism and philosophical investigation. In the former, the mind avoids the True because it avoids labor, and, in indolent ease, doubts and doubts until it doubts its own existence. The beautiful developments of organic life which surround it,—shadowing forth to us a type of our own life and destiny,—the gigantic reactions occurring between the surface and the interior of our earth,—the perturbation of planets in their ceaseless orbits,—the remains of animals belonging to the youthful days of our planet, dug up from the earth itself;—all are to him but the productions of chance, the results of fortuitous forces. General laws will never be enunciated by this class of minds, though a thousand corroborative facts be found to sustain them. The film of prejudice is drawn closely over their visual organs, and the light of nature's truths is shut out from their minds. The avenues to thought are closed with a barrier which resists the most palpable arguments from without, and the mind, rejoicing in its own stupidity, grovels amid the low and silly thoughts which such a scanty soil can produce—crawls like the worm along the earth, instead of directing the eye of investigation to the vast expanse of nature around, above and beneath it. Far different the tendency of philosophical observation, in the words of a veteran observer of nature, "when based upon science, *it* doubts because it seeks to investigate, distinguishes between that which is certain and that which is merely probable, and strives incessantly to perfect theory by extending the circle of observation." In taking a cursory view of the progressive tendency of Physical Science, as shown by a comparison of the shallow opinions of the *Past* with the wider and more comprehensive views of the *Present*, and, from these two stadia in its course, deducing what may be expected in the *Future;* we shall see in the progress of the investigation how blear-eyed Prejudice and beclouded Thought delayed the discovery of the causes of Physical Phenomena for centuries; we shall see how Empiricism necessarily preceded sound Philosophy,—how really useful investigations after the Impossible, on the part of the ancients, proved to their more fortunate successors, and how much good always results from cautious and thoughtful inquiries into the laws of Nature.

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* Cicero, de Fin. Bon. et Mal., quoted by Sir John Herschell in his "Treatise on Astronomy."

The idea of the Earth's stability was probably the parent of the ignorant and superstitious notions which constituted the scientific faith of the ancients. This was more firmly believed on account of the apparent rising and setting of the two luminaries which regulate the natural division of the day. Hence arose an indisposition to any diligent investigation of the earth's position in space, or its relation to the surrounding stellar bodies. Man is ever averse to believe any thing not plainly perceptible to his senses, and *here* he necessarily made efforts to account for what seemed really true, rather than to investigate its truth. The Chinese, conceiving this stability as settled, directed his mental energies towards the discovery of some supporting power for such a huge mass of land and water; and failing in his knowledge of the mighty forces of Nature, had recourse to animal support, and placed eight elephants facing as many points of the compass beneath the earth. Other nations of antiquity had full as crude notions of its supporting power, but, restrained by the conscious feeling that no explanation of this kind was tenable, avoided giving expression to them.

The Chaldees, Arabians and Egyptians were the parents of all Astronomical and Chemical knowledge. Their lives, as those of all nomadic tribes, were spent in the open air, roaming over widely extended plains, where the clear atmosphere grants to observers frequent opportunities for beholding the whole expanse of heaven bestudded with innumerable hosts of stars. Their minds were directed towards the movements of these heavenly bodies, and though errors may be detected in almost all their calculations, still an astonishing amount of accuracy may be found amid these errors. Eclipses of the sun and moon were noticed, and many correct conclusions were arrived at in the science of Astronomy. Laboring in the dark, with reference to the *general* laws which regulate the starry universe, and noticing with singular accuracy the regularity of planetary movements and the probable *existence* of laws governing perturbations, they concluded that an influence was exerted by the stars over the destinies of man. Astrology came thus into existence, not in full panoply as Minerva from the head of Jove, but by slow development reached its full growth and influence over mankind. The planet that shone at birth was considered the guardian of man down to the latest period of his existence. Its movements and position in the heavens were supposed to be omens portentous of good or evil to his future career. And as the Roman general consulted the augurs on the eve of battle for advice, and with religious devotion followed their directions, so his successors in the school of predestination had the awful book of the astrologer laid before them, and then surrendered themselves to its pretended prognostications for the future. A *nativity* regulated the aspirations of man, and clogged all enterprise. For what believer could have dared an enterprise when an unfortunate conjunction of stars had been interpreted as unfavorable to its successful termination? The trite maxim, *Quisque suæ fortunæ faber*, was made to read, every man's destiny is regulated by his natal star.

To the Alchemists, however, of olden times, reaching down to a late period in the Christian era, we must look for some of the most astonishing discoveries in Science. These Philosophers, actuated by a desire to prove certain pre-determined principles, and to obtain certain imaginary substances, performed many singular experiments, and discovered much that has been useful to mankind since their day. They taught that matter was resolvable into four elements, and that out of these it was possible to recreate all things, could the proper proportions only be obtained. Each of these elements was under the care of a peculiar class of Genii, who doled out to the Alchemist occasionally some of its secrets, as a response to his most importunate invocations. The gentle and graceful *Sylphs* floated in every breeze that wafted by the Theurgist's cell,—the fair forms of *Nymphs* filled every nook from whence flowed the gushing fountain,—the rough and mystic *Gnome* presided over all who delved the earth, and guarded its most inmost recesses,—and *Salamander* lived, moved and had its existence alone in the purity of the flame which was kindled by mystic rites, and kept alive by magic ceremonies. These Genii were the deities to whom the Alchemists offered their prayers; and, carried away by their own poetic fictions, they endeavored selfishly to keep all the results of their investigations to themselves.* As the Monk of Ilchester, Roger Bacon, expressed it, "*in opibus artis et naturæ, ut secretæ occultarent ab indignis*," —that they might conceal the mysteries both of Art and Nature from those unworthy of possessing them. But human life was too short to prosecute such discoveries to the extent of their wishes, and their fortunes were too frail to bear the expense. This naturally led them in pursuit of a substance which should have the singular power of prolonging human life beyond the short period of years allotted by divine command; and of a stone which should convert baser metals into those of more magic importance to the eye in the dealings of mankind. Investigations of this kind gave the world a knowledge of some of the most important minerals, of the carbonated alkalies, and of the mineral acids; and though their authors toiled on in their prosecution of the impossible, and lamented the fruitless nature of their tasks, still we now see the incalculable benefits which have resulted to us from those chimeras. The toiling Alchemist watched with untiring assiduity the contents of his crucible, and, deluded by the flimsy creations of his own imagination, expended his fortune, time and existence in endeavors to prove his favorite theory. His profession was an attractive one, surrounded by the prospect of a long life unaffected by disease, and wealth incalculable, he sought the *realization* of his idea with all the enthusiasm of glowing youth; and even as age crept over his physical system, deadening his sensibilities and stagnating the rich fluid which once coursed so gaily through his veins, he still clung with the same tenacity to its *plausibility*, and only with the total extinction of his vital powers resigned his position by his furnace to younger and still more sanguine spirits. The Science was attractive, and drew many away from the busy ranks of men to spend their lives over the stupifying, death-bringing vapors of the laboratory. Gold and long life are both attractive features in any age and to any nation, but here they were offered to man in exchange, not for power or for servitude, but for the mere seeking. Their furnace fires glowed with the white heat of calcination from the morning's dawn until the disk of the sun again rose above the horizon on the morrow; the mystic rites of a Geber were performed with all the solemnities their importance demanded; the Spirits presiding over the dark deeds of Alchemy were invoked with fear and trembling, until by frequent refusals to appear, the Alchemists became bold enough to command their presence. But all in vain; the mysteries of Geber proved to be as unavailing in the spirit-world as his words were unintelligible to human comprehension; and Plutus with his court, like the coquette of modern times, seemed only the more disposed to fly away as his admirers became the more solicitous for his company.

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* Salverte's Phil. of Magic, i, 186.

Their labors were not fruitless, as has been said, but though rich discoveries were being turned out daily from their crucibles, which have become to us of more practical value than all the placers of our American El Dorado,—though Science showered down upon its votaries her choicest gifts, as from a cornucopia, still they were unnoticed;—urged on by a desire to penetrate the Arcana of Nature, nothing less than the attainment of this desideratum could satisfy their longing wishes. They had taken one step forward in the progress of physical investigation, that of experimentally testing what had before existed only as speculative opinion. Their boldness in this way demands full as much admiration from us as their perseverance. Every step they took was on *terra incognita*, and without a guiding star to conduct them through the devious paths with which this land abounded. Like the mariner of their own day, coasting along the shore, fearful of losing sight of this, (his only guide,) and never venturing boldly forth on the trackless deep, their predecessors had satisfied themselves with what was apparent to the senses, and never endeavored to scan the mysteries of Nature. It was an advance in the history of the human mind, meriting our highest respect.

The introduction of Christianity, and the subsequent promulgation of the doctrines of the Catholic religion, delayed for awhile further attention to this branch of investigation; until the establishment of monastic orders, in which men were separated from the world and devoted their lives to meditation, gave additional impulse to its study. The Monks found here something to relieve the tedium of their monotonous lives, and devoted themselves with as much zeal to the work as their sluggish dispositions would permit them. Many important discoveries were made by them, and their name has become renowned in science on account of the fatal results of some experiments made by one of their order, Basil Valentine, in the fifteenth century.

Gradually the Alchemists themselves gave up all credence in the existence of the two grand objects of their search, and gave way for a new class of investigators, who combined the Astrological robe of the Chaldean with the Alchemist's alembic, and *Leeches*, who pretended the cure of all the "ills to which human flesh was heir," flooded the land. Another delusive idea had flitted across the human mind, and caused a long series of laborious investigations. It was the probable existence of some general antidote to all poisons, which, after the Italians, was called the *Orvietan;* and here again, as in the search after the Philosopher's Stone, mankind has been greatly benefited by the accidental discovery of many agents of real utility to the medical profession.

The buddings of Science were of little promise to the world; for the plant had been secluded from the brilliant light of the day, and received its nutriment only from baseless abstractions and crude, unshapen theories. The physical world had not as yet been illumined by the rays of the Sun of Truth, but was beginning to hail the dawn of better things by the few straggling beams of light which were showing themselves above the eastern horizon,—these were received as precursors of the full appearance of the glorious orb, when the minds of men should be prepared to appreciate it. The great obstacle in Christian countries was an indisposition to interpret the Bible in any other way than that they had been taught for centuries. Hence, Galileo, when arraigned before the Inquisition for promulgating heretical, or, as they must have appeared then, infidel views, was forced to recant his own theories. It was a humiliating sight to see the man of Genius bow before the narrow-minded Ecclesiastic,—to hear him protest that his darling theory was a chimera, and that his arguments in its favor were only hallucinations of a disordered brain. But while we condemn the inquisitorial authorities for interference in the onward course of Science, we should honestly take the prejudices of all Christendom into consideration, and see how averse we would ourselves be to an overthrow of opinions based upon the sanction of centuries. Indeed, there are many subjects, as incontestibly true as the motion of the earth, which are at the present day received with as much coldness as Galileo's theory was in days of old. In the words of one of the brightest stars in the galaxy of American science,* "The relation of Geology to Sacred History is now as little understood by many theologians and biblical critics as Astronomy was in the days of Galileo."

Experimental investigation by the scientific men of those days was the forerunner of something brighter and better in the future, bidding fair to put to flight the thick pall of darkness that enshrouded physical phenomena. After a night of universal gloom, —the bright glimmerings of dawn were hailed by the world with ecstatic joy. It was the transition period,—the bridge of Mahomet, leading from darkness to light,—such was the *Past* in the history of Physical Science.

A new method of observation now characterizes the investigating spirit of man,—"Striving to elevate itself above the narrow requirements of mere description," and not binding itself to "an accumulation of isolated facts,"—phenomena are investigated, not that pecuniary benefit may result to the investigator, but that he may add his mite to the mass of knowledge that has been accumulating from the birth of time. We hear occasionally at the present day of *Useful Knowledge* from the lips of those who think utility is best measured by the per centage it affords one for expenditure of time and fortune,—that it is synonymous with pecuniary profit. A low and debasing idea, emanating from minds carefully secluded from the light of truth by a dense cloud of ignorance or prejudice. All knowledge is useful, whether it be moral, physical or mental, and contributes to raise man with its increase higher and still higher in the scale of preferment. It forms the purest source of delight, the noblest point of aspiration. We acquire an acquaintance with certain facts in the physical world, which gives us an impetus in a certain direction, and sets our bark afloat on the sea of speculation. Though there may be but one star by which we can guide our course over the darkening ocean, yet it will prove to be a polar star, and we shall finally attain the desired land. The rude winds may blow us back to the point from whence we started, may threaten to engulf us in the black abyss old ocean has opened at our feet, and to pile up huge waves, like Ossa upon Pelion in olden times, to mark our burial-place; while the "huge monsters dimly seen through the surf may wait him who drops." Yet the bold scientific investigator of the Present knows no fear; dauntless, pushes his boat vigorously along the angry waves, and by sturdy pulls presses onward, until at last the joyful vision of land in the distance presents itself —the reward ofhis labors.

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* Professor Silliman's Appendix to Bakewell's Geology, 576.

The scientific men of the present owe the great success which has attended their labors to two grand causes. I. The disposition to prosecute investigations with unbiased minds. They have not as a general thing started out to prove a dogma, which has presented itself to their imaginations as real, or to force all nature to bow to the rule laid down for her by themselves. Such freedom from prejudice has qualified them to appreciate every result of investigation, even though it should have upset the theories of centuries. Reason walks side by side with experiment, and has always been found by them to explain, after due study, all apparent lawless aberrations. Here investigation is carried on to find truth, rather than to force nature to stand up to the support of a peculiar theory. The real as such in the physical world is deemed of far more value than a host of baseless fancies; and when found is appreciated for its *own* sake,—the lover of nature knowing no utility greater than the attainment of truth itself. Hence elaborate researches into nature with the view of knowing every thing that should be cognizable, have resulted to us in the exposure of the richest mines of truth, separable with ease from the dross concealing it. In the greater number of instances such researches were carried on by Philosophers without any definite object in view—ready to seize what might ensue and appropriate it to the use of Science. The accidental fall of an apple directed the mind of Newton to the discovery of gravitation, and was the cause of the discovery of the laws governing our planetary system. The facts here had been known for ages, but their importance had not been considered until the mind of the great Philosopher seized them for the illustration of a general law.

II. Division of the field of labor. At the present day we are able to separate the wide and illimitable field into numerous divisions, to each of which a separate corps of investigators has been by choice assigned. Where three hundred years ago one man was expected to be perfectly acquainted with the whole field of observation, hundreds of minor divisions have been made, each of sufficient magnitude and importance to claim the undivided attention of one person; and thus, instead of a superficial knowledge of all, a profound acquaintance with one is obtained.

Permit me now to direct your attention to the condition of Physical Science under the operation of these two causes.

The Science of Astronomy is yielding up its mysteries as a reward for the midnight toil of its votaries. The fixed stars have been recognized as the centres of other and different stellar or planetary worlds, and the hitherto irresolvable nebulæ have given way to the superior power of our optical instruments, and revealed their most intimate structure. The grand simplicity which marks nature's laws is beginning to present itself to the mind of the observer; the mathematical accuracy with which the movements of the heavenly bodies take place, can now be expressed in appreciable numbers; and the mathematician, seated in his chamber with the tabular systematization of his labors before him, can as infallibly predict the discovery of a new planet from the mutations of its fellows in the heavens, as if it were directly under the range of his telescope. The Astronomer no longer roams amid the fantastic notions of his predecessors, and sees signs and prodigies in the heavens of a supernatural character,—but recognizes all as subject to the power of universal law. All belong to one common system—the result of his heavenly Father's handiwork; there is a mutual dependence of each upon the other and one upon the whole. Phenomena upon phenomena arise before his bewildering vision, and each result of investigation only gives cause for further and diligent study. The results of empirical investigation are daily accumulating around him until at last they arrange themselves in due form under the influence of a more thorough and effective system of philosophizing. By generalization these facts are made useful and subservient to the cause of science; and with each new resting-place in his career as the prospect before him grows wider and more extended, his spirit flags not, for knowledge brings its own reward and confers strength adequate to any labor. His views of nature direct him to the majesty of the Supreme Governor of all, and he is lost in wonder and amazement, —the prospect of worlds filling all space overpowers his giant intellect, and he bows the reverential knee before the all-creative Power. An undevout Astronomer! It would be the most singular paradox ever presented for the contemplation of the human mind,—an incongruity unparalleled in the natural world,—and only to be explained by the supposition that reason had left its seat in his brain, and in his folly he had gone mad.

Turning from the Science of Astronomy to its sister Science, Geography—by that including a physical knowledge of the earth, we find the whole field occupied by observers. Columbus here first gave an impetus to its study, by directing general attention to the idea of the earth's rotundity, and partially proving it by his discoveries of land in the western part of the great Atlantic Ocean. Since then this Science has rapidly progressed, its votaries have directed their attention to the physical condition of continents and immense reservoirs of water,—and diving into the bowels of the earth, have brought forth the pages of its history, lithographed by the hand of time upon the largest rocks and smallest pebbles. The narrative of Holy Writ is supported by the geological testimonial, and the infidel mind, which recognizes belief in the rise and fall of stocks, but not in the existence of a Creator, is forced in this particular to admit that his system is far from satisfactory, and that Nature always supports Revelation. The written history of the world, as furnished by itself, fastens down confirmation strong as human mind dare require, in the verity of Revelation.

The beautiful productions of the vegetable world open wide their realms to the investigation of the Botanist, who no longer satisfies himself with the dry catalogue of names that occupied his predecessors' attention, but thoroughly investigates the physiological structure and medicinal qualities of the various plants. He now finds an ample field for the exercise of his talents amid these members of the lowest ranks in the organic kingdom, and where

> "The proud tulip lights her beacon blaze,
> Her clustering curls the hyacinth displays,
> O'er her tall blades the crested fleur de lis,
> Like blue-eyed Pallas, towers erect and free,"—

there he feels himself surrounded with subjects worthy of the most profound study. Looking back upon what he has acquired, and comparing it with the undiscovered expanse before him, the difficulties of investigating the laws of life and the conditions which govern them, he sees ample room for study in this branch of Science as long as life shall last.

Alchemy has, under the genial influence of sounder views of its end and design, been converted into Chemistry, which now stands at the head of all physical science. It brings its followers into the Laboratory, and there over the vapors of mephitic gases shows them the dangers which may beset their operations in the deep caverns of earth, and supplies them with a means of rendering them innocuous. It takes the most incorrigible of metals, and subjecting it to the influence of one of its gases, transmutes its deadly powers into a life-bringing agent, which the son of Æsculapius uses with the bright prospect of conquering the fatal effects of disease. It enters the workshop and manufactory, and on all sides the practical results of its operations meet you in novel forms and useful compounds. It enters your *cuisine*, and holds the cook bound by its commands. It walks forth under the broad expanse of heaven, and the full blaze of Truth designates it as the Interpreter of Nature,—the grand Pythoness of Mysteries. Its most intricate mazes are as intelligible to the first dawn of reason as to the matured and thoroughly trained mind;—to the child in his first elements as well as to the gray-haired veteran. It widely opens its portals to all classes and conditions, and no longer actuated by a mistaken notion of mystery, surrounds itself with an impenetrable veil of secrecy. Instead of the Philosopher's Stone, we have learned the properties of all metals and their manifold combinations, the characteristics of a life-sustaining atmosphere and the deadly nature of peculiar gaseous emanations. Instead of the Elixir of long life, we have found antidotes to disease, and have learned to assist Nature to free herself from peccant humors; we have learned to bring relief to the poor wretch tossed upon a bed of anguish under the racking effects of burning fever, and by a drop of water as it were to cool his parched tongue,—to infuse life and vigor into the dying man, and cause him to rise from his dejected condition as a Phœnix from the ashes of his former self. Instead of an universal solvent, we have found means to combine the most heterogeneous substances, and thence educe new agents of great utility. The vegetable world has been forced to give up to suitable solvents its valuable properties, and thus by a happy knowledge of Science the vilest weeds become of considerable importance to mankind. By a course of long and protracted investigation these results have been obtained, and her votary can now exclaim:

> "I have made familiar
> The blest infusions
> That dwell in vegetives, in metals, stones;
> And I can speak of the disturbances
> That Nature works, and of her cures: which gives me
> A more content in course of true delight
> Than to be thirsty after tott'ring honors,
> Or tie my treasure up in silken bags,
> To please the fool and death."

Steam, since its elastic force was proven by the French philosopher, has gradually occupied the attention of Mechanical Science, and the gallant vessel breasts the giant billows moved by *its* enormous force. The smoke of a thousand manufactories tells of its utility to the race, the rumbling of a thousand cars, uniting in an incredibly short space of time distant parts of our land, speaks of its importance in the general distribution of feelings of kindness and brotherly love. By a net-work of railroads it has promoted an interchange of feelings and manners between distant lands, and thus contributed to advance the moral and intellectual condition of the race. Physical Science here has preceded Mechanical, and is the proper source of all the benefits resulting from the perfection of the latter.

A few years have rolled around since the identity of Electricity and Lightning was proven by our American Savant, and now the agent that held mankind in awe as the instrument of an angry God, has been so confined and restricted within certain limits that we make it a common carrier of news,—a Mercury far swifter and more sure than he who waited at Jove's high court. It bears with equal rapidity sad tidings of bereavement and the joyful announcement of success over its metallic wires; and a *Morse's* name becomes associated by this discovery with that of a Franklin.

It becomes " the instrument of man's desire
To hold communion with his fellow man,
In distant fields—in other climes afar—
Swifter than flight of migratory bird—
Nay, swift almost as speech from mouth to mouth."

Science had heretofore been sleeping like Endymion: there he lay, fair and beautiful as the morning, with the roseate hue of health upon his cheek. But the bright eye was closed,—the gate to the soul was guarded from intercourse with the world. The sky was beclouded with dark, gloomy vapors, and the living, breathing being did not awaken amid its gloom. Soon the clouds began to break over the slumbering corpse,

" Starry are the heavens, lit with eternal joy;
Light like their own is dawning sweet and slowly
O'er the fair and sculptured forehead of that yet dreaming boy.
Soon he will awaken!
Red as the red rose towards the morning turning,
Warms the youth's lip to the watcher's near his own;
While the dark eyes open, bright, intense, and burning
With a light more glorious than, ere they closed, was known;
Yes! he has awakened
For the midnight's happy Queen."

The investigations of the present have only opened the pathway to future research, and the field now extends before us wide and illimitable. The characteristic spirit of this portion of the history of Physical Science will be that of deep longing after a knowledge of the Arcana of Nature, and an elevation of man in this way towards a nobler condition. The present age is only engaged in preparing the formulæ, which their successors will work out with mathematical accuracy, and educe therefrom the most startling results. Thus all things have worked for the proper advancement of Knowledge. In the Past naught was done but to gain a host of empirical phenomena ; the Present has classified them and deduced general laws,—it is left for the Future to investigate, under the guidance of these laws, and such as may hereafter be discovered, the great system of the Universe. How grand then is this department of human knowledge ! Its importance is seen in every profession, and makes every trade acknowledge its right to be thoroughly studied. The wild fancies of our forefathers have, it is true, been swept away by the onward march of utilitarianism,—the light and graceful sentiment of pastoral poetry and pastoral music, *sub tegmine fagi*, has disappeared before the enthusiasm of the scientific Naturalist,—the quiet recesses of sequestered forests have been invaded by the adventurous student of Nature,—the banks of beautiful streams, formerly occupied by the wild, nomadic Indian, are now resounding to the sturdy blows of the axe, while the Philosopher views the triumph of his researches in the factories which cover the same banks, and in the misty cloud which marks the path of his steamboat. This change is to be hailed with delight, for it does not announce the death of poetic feeling, but a change of its basis from the flimsy and unreal to an accurate knowledge of Natural Phenomena. The Dryad and the Hama-Dryad have been ejected from their quiet haunts, and Pan no more shall pipe through the forests. Their day is past. Yet is Poetry not dead, but is now in a chrysalis state, from whence she will come forth decked with greater glory, and by an intimate communion with Truth portray to the mind the world of the ideal and spiritual. The Future will connect the ideal with the real, and the abyss which now apparently separates them shall be bridged over by the hand of Science, and their close union the more beautifully exhibited.

The ideal first reigned and controlled, without opposition, the mental activity of man. The practical and real then usurped its place. It is to the Future the noble task is assigned of showing that the two are properly but different phases of one and the same thing. The ideal and the unreal are now considered as synonymous terms; but when the developments of Science shall more perfectly set forth the truths of Nature, they will be found as different as the light of day is from the veriest gloom of night. This forced union will be dissevered and their contradictory positions clearly understood. Then the ideal shall be found to show itself to the perception of man truly in the world of the real, and only there. In proportion as this relation is practically understood, will our advances be higher and higher in the region of Knowledge; the grosser perceptions that have clogged Fancy shall be thrown off under the genial influence of Truth, and Imagination will represent true thoughts in their proper garb—that of reality. Thus the Future will produce an union between the coolness of reason and the flashing fires of imagination, and what of interest the latter may lose in the absence of the unique or grotesque, it will more than gain in the attractive beauties of the gorgeous robes of Truth. The simplicity of our ideas will render them more beautiful than all the meretricious coverings of a lawless imagination.

With this prospect before us of the advantages that shall accrue from the study of the Physical Sciences, let us glance at the claims it possesses upon the attention of the youth of our own day. Among the host of studies which claim attention from the human mind, the peculiar importance of this department shall then be better understood.

Its intimate connection with the daily operations of life, the relations it bears to the physical economy of man, the support it gives to the revealed doctrines of our religion, and its own importance as the embodiment of truth—all press themselves forward as reasons of sufficient importance to claim the attention of the student. Were we to dilate upon either of these, we should have arguments all-powerful indeed. But there is *one* especially meriting attention.

The infidel tendency of the age has tortured Science, so as to contradict Revelation,—has wrested facts from their moorings and thrown them out on the ocean of Chance,—and thus endeavored to create doubts with reference to their origin. The rationalist has attempted the same thing by an imposing array of scientific arguments, laboring to derive conclusions from them which would free us from the necessity of having a superintending divinity, and to set forth all created things as the sequences of the operations of one grand law. These two antipodal modes of gaining the same end,—the overthrow of sound Christian doctrine by casting discredit upon the truth of its great text-book,—are to be met by scientific theologians, arrayed in that full panoply which a thorough knowledge of the *facts* of Science shall prepare for them. The infidel has been met, in days that are past, by giant minds, and the doctrine of chance has been upset by "*the power, wisdom, and goodness of God, as manifested in the creation.*" A few disciples of this barren and insipid doctrine still live in some dark parts of our country, and there can be preparation always on hand to meet *them* with every assurance of success. The rationalist, however, threatens more formidably the overthrowal of sound doctrine, and with the guile of the serpent allures the young and the unwary, by the form of veneration of the Most High which he affects so artfully, on to the snares of unbelief,—charming them by bright, attractive views of Science tortured into meretricious beauties through the kaleidescope of his sophistry. Protesting against the supposition that he is an unbeliever, he coolly and insidiously pulls down our belief in the revelations of the Bible, boasting that all this is in strict accordance with the revelations of Science. His sophistical deductions are sent forth to the public, where they are eagerly caught up by the enthusiasm of youth. Who can tell the amount of injury thus produced? With such appeals to Science, the best man may be confounded, and though his faith shall not be shaken, still there will be mortification of spirit that he cannot find Science supporting what he *knows* to be true. Thus we see the evil to be expected from a careless use of Science, or from a superficial conclusion with reference to its facts. The field for contention is removed from the dry discussions of the schools to the broad expanse of Nature, and even here the God of Nature is rejected by the self-sufficient Naturalist. It is of no avail to refer to the awful authority of revelation, for the *reason* of these philosophers rebels against all traditionary lore; nor shall we succeed by showing the evidences of God in the world teeming with life around them, as their intellect calls these the operations of a mighty law. We have another resource, let us examine their proofs, unterrified by the apparent weight of authority making them impregnable to the eye, and all their mighty castles and towering bulwarks disappear before the investigating mind of the Christian philosopher, as the mist before the rays of the sun. The famous development hypothesis which, under the attractive form given it in the "Vestiges of Creation," has been presented to the notice of the public, startled for awhile even the wary philosopher, on account of the support Science seemed to lend to its specious deductions. The grand chain of being leading from inanimate matter to animate, from mortality to immortality, had often formed the theme of the Poetic Muse, and the idea of mutual dependence had inspired men long before the time of Pope, when he said :

> "From Nature's chain whatever link we strike,
> Tenth or ten thousandth, breaks the chain alike."

The ancients had gone farther, and we find that Plutarch recognized in his private religious creed intermediate orders of beings between mortality and divinity,—that these genii or demons were refined from the gross errors of a former existence, and so etherealized as to enter a higher and still higher position in the scale of immortality, and like the relation of the Assymptote to its curve ever nearing but never reaching the pinnacle of perfection. The garb of novelty was the great attraction in the *Vestiges*, but, alas! even this merit has been stripped from its back, and we find nothing left but the old Pythagorean Philosophy arrayed in the tawdry finery of a few garbled truths of Science. The old Greek held precisely the same doctrine,—"that the universe was at first a shapeless mass, and that all subsequent forms progressed through certain gradations until they arrived at perfection." There is wanting only an additional article in the creed of the modern to make it an exact fac simile of the original,—the poetical doctrine of the music of the spheres, which the gods occasionally permitted Pythagoras to hear. And shall we be told at the present day that the Science of two thousand years has given no aid to the doctrines of revelation, but has only succeeded in stamping truth upon the notions of a heathen sage,—depriving *them* indeed of the belief in God's existence? Is the only relief afforded to the Christian to be found in a statement that the Bible was never intended to be a book of Science, but a mere historic record adapted to the common mind? No, surely not! All geological testimony shows the falsity of this theory, proves that no class of animate beings could ever have been the result of a higher state of development from an inferior class, but rather that all have been produced as the results of special creations, and that at the time they were ushered into existence, in the language of the Mosaic record they were all very good. The remedy for all this theorizing is found in a close and careful investigation of the ancient records of the earth, written on the everlasting hills, in deepest caverns, in volcanic fires, and in fossiliferous remains of animals and vegetables long since extinct. These are the *Vestiges of Creation*, which beautifully display themselves before the Christian student, as infallible *Footprints of his Creator*. By their aid he silences the deductions of miscalled rationalists, and the daring doubts of the infidel,—he learns to revere more and more the Author of the stupendous plan of the universe, and to acknowledge his own utter insignificance before Him.

What a grand position for Science in the Future! How sublime a sight to see her acknowledged as the supporter of revelation,—a defender of the faith far more fitted for the office than any mailed king at the head of his warlike forces! She will then present herself, freed from the gross errors which have perverted her facts, and all irradiant with light and truth will acknowledge her greatest glory to consist in being the hand-maiden of Religion!

Such is the future destiny of Science,—such her duty! and, brethren of the Goethean Literary Society, need I add one word of inducement to *you* to devote your leisure hours to its cultivation? The field is before you,—open wide for distinction,—free as the balmy zephyrs which play so gratefully over the heated brow of the traveler as he stays his steps by some gushing stream,—no oppressing care or fear to molest,—no dark passion or hovering melancholy to dampen ardor,—but all open and only open to fresh, vigorous, active and untiring labor. "The exquisite enjoyment that springs from the pursuit of truth" is a greater reward than the laurel crown which covers the head of the bloody conqueror,—brings more pleasure to the inmost soul of man. And having labored in the flowery paths of Science, and done battle valorously against the enemies of Truth and Revelation, until the dark struggle of death announces a close of your earthly labors, may you all acquire that blissful reward in another world for which a deep insight into the mysteries of Nature, and a reverential obedience of its Great Maker's Laws, has prepared you.

PARACELSUS

AND

HIS INFLUENCE

ON

Chemistry and Medicine,

BY

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ADDRESS.

To Paracelsus,—a native of Switzerland—Chemistry is more indebted for a proper attention to its nature and design, by way of directing the public mind to its importance, than probably any one of those mighty minds that have travelled the path he pointed out and honestly grappled with such difficulties as might by found obstructing their progress. A course of investigation commenced with him, which had for its object, the application of chemical remedies to the removal of disease, and tended, in a great measure, to dispel the miserable chimeras that were conjured up by the men of his time, as the close guardians of all knowledge. For *this* alone, though no actual contributions had been made by him to the stock of human knowledge, it would be right that his exertions should be properly understood at the present day; and a *proper* understanding of this, will induce us to overlook that otherwise intolerable presumption and egotism which seem to have pervaded his whole life.

Prior to his time, the profession of Medicine was mostly prosecuted as a mysterious art and surrounded with all the paraphernalia of empirical pretension, while Chemistry, at best, was only a search for the supposed method of transmuting baser metals into those of more value to mankind on account of their rarity and comparative indestructibility when exposed to the action of fire or the atmosphere. Its devotees enshrouded themselves and it, with all the mystery they could command through the wonderful effects of their re-agents, and the credulity of mankind. This last they lost, since long before Chemistry was freed from the trammels of mystery, mankind had forgotten how to be credulous. Credulity was completely driven away by the scorn and ridicule the arrogant students of Alchemy excited on all sides. Indeed Alchemy was based originally on mystery,—its very name (*al* the, *komia* mysterious) indicating the view its own followers took of its end and design. Its origin likewise, probably in Egypt—the land of mystery,—associates it at once with the dark and the hidden. Its objects were neither to benefit man by teaching him those actions which take place in the vital laboratory, nor to afford him means of meeting an impaired organism, but only to procure those substances which minister alone to the baser passions of our nature.

Alchemy has generally been considered the invention of Hermes Trismegistus,—an Egyptian,—who is said by legendary history to have been the son of Ham. Of the personal history of this Hermes, nothing is now known save some contradictory statements, bearing on their face, evidence of modern origin; but a table, which is alleged to have been removed from his place of interment, with the inscription *Verba Secretorum Hermetis Trismegisti,* clearly shows that quite as much account was made of mystery by the father of this art as by his followers in after ages. He had an indistinct notion that all nature was resolvable into one element and, in accordance with this idea, he says in the table;—Sicut omnes res fuerant ab uno meditatione unius; sic omnes res natæ fuerunt ab hac una re adaptatione. Causa omnis perfectionis rerum *ea* est per universum hoc. Hence he labored to procure the noble from the baser metals, considering it only necessary to cause a change of state in this *one* element to produce gold or silver at the will of the experimenter.

Aristotle, after Hermes, advanced the doctrine, that instead of one, there were four elements, from which all material substances were formed, and that these elements were earth, air, fire and water. Modern science has long since satisfied us, that three of these are compound bodies, and the fourth—fire, is the result of "intense attraction between two or more substances." The doctrine of Aristotle, however, was held for centuries, until exploded by the Arabian Alchemists, under their great chief—Geber. The latter taught that all metals were composed of but two substances—mercury and sulphur, which, with salt, constituted the elements of all matter. The doctrine of the four elements had been forced to give way to another doctrine, equally as erroneous, but still worthy of note, as an indication of the progressive tendency of human investigation.

The Arabian division soon gave way before the discoveries that were almost daily stumbled on by the disciples of Geber, in Arabia, and others on the continent of Europe. The state of Alchemy at this time exhibited ever and anon a glimmer of that true light, which should afterwards contribute so much to man's wants, comforts, and luxuries. It was not the dawn of day, but the gradual disappearance of the thick darkness of midnight, which this period in the history of science truly displays. Phenomena were accumulating on the hands of its devotees, it is true, little understood and accounted for by occult causes, yet, it was necessary for such an accumulation, before truth could be deduced for the benefit of the race. Geber produced the first book ever written on this subject, and we learn, notwithstanding the mystic nature of his experiments,* "in general, it is written with so much plainness, that we can understand the nature of the substances which he employed, the processes he followed, and the greater number of the products which he obtained." It would be a matter of much interest to examine the accumulated results of his observations, but it would lead us too far away from our subject. We are only able to glance at this veteran Alchemist of Arabia, who, in despite of that indisposition to severe mental labor or diligent investigation of any subject, which marked his nature, evoked some little order out of the chaos which surrounded his favorite pursuit, and cleared the way for other and surer guides in the department of science.

Paracelsus was born in the year 1493, at Einsiedeln, in Switzerland, and probably had his attention turned to the profession of medicine quite early in life, as his father was a physician, and practised his profession in the place of his son's nativity. An education of a limited character at home, with a natural bent for experimenting on the nature and constitution of things around him, served to direct his attention in after years, when he roamed through different lands, picking up fragments of knowledge from all sides, to those chemical investigations which were to be of so much importance to the world. He visited France, Spain, Italy, and Germany, and seems to have paid some attention to Chemistry, and kindred branches, as taught at the most distinguished Universities of those countries. With a looseness and lack of dignity, unknown to his profession at that time, he communicated freely, with all classes of people, on the subjects of disease and its remedies,—was boon-companion of all classes, whether professional or unprofessional, learned or unlearned, from men of the position of Erasmus and Oecolampadius, down to any garrulous old crone who would talk with eagerness on domestic remedies. By this mingling with all classes in society, and being looked up to with respect by most of them, he acquired a collected series of facts, which availed him much in his treatment of disease, and, at the same time, so inflated his vanity that he publicly consigned to the flames, in the presence of a large assembly, the works of Galen and Avicenna, declaring his shoe-strings were wiser than these two eminent writers. His family name, Bombast de Hohenheim, with the prefix, Paracelsus, was not sufficiently high sounding, and he called himself Philippus Aureolus Theophrastus Paracelsus Bombastus de Hohenheim.

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* Thomson's History of Chemistry, vol. 1, page 117.

In 1527, he entered upon the duties of Professor of Medicine, at the University of Basle, being elected to that position by the magistrates of the town, at the instance of Oecolampadius. Here, in his vernacular, and occasionally in barbarous Latin, he lectured to large and enthusiastic audiences for some time—attracting some really anxious to know those remedies he was introducing, so effectually, into medical practice, and others actuated by a desire to hear those denunciations he poured out *pleno rivo* on the heads of his rivals. His vanity and inflated style of speaking, largely increased by such flattering audiences, at last excited disgust and contempt with his class, and it dwindled down to a very meagre number.

But his faults were not confined to those of egotism and vanity,—they included drunkenness and licentiousness. In a state of intoxication, he generally entered his class-room;—visited his patients, and dictated his lectures, in a like condition. Doubtless, to this pernicious habit, must be attributed much of that pompous egotism, which proclaims so authoritatively: "* Me you shall follow, you Galen, you Rhazes, you Montagnana, you Mesue. I shall not follow you, but you shall follow me. I shall be monarch, the monarchy shall be mine. * * What will you think when you see the sect of Theophrastus leading on a solemn triumph, if I make you pass under the yoke of my philosophy? Your Pliny will you call Caco Pliny, and your Aristotle, Caco Aristotle?"

He only retained his position, as Professor, for one year, having given up his chair in consequence of a quarrel with the magistrates of the town, with reference to a suit brought by him, against a rich ecclesiastic, which suit was decided against him. After this termination of his professional duties, he led a life of irregularity and drunkenness, roaming from place to place, accompanied by a number of followers, who adhered to him through good and evil fortune. His occasional cures of diseases, given up by the rest of the profession, served to retain for him a large share of his former reputation.

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* Thomson's History of Chemistry, vol. 1, page 146.

Ungoverned by religion, he denied the authority of the Pope, and denounced Luther,—the one for asserting that which Paracelsus did not believe, and the other for not condemning the Pope as heartily as he did. He looked upon the Scriptures as containing the sum of all knowledge, and also, as actually treating of all things. Medicine, he insisted upon it, must be given by a Theosophist; for such an one could see, by faith, more clearly into the hidden causes of disease, than any other man, on account of his inner illumination.

He boasted the possession of the philosopher's stone, and the Elixir Longæ Vitæ, and notwithstanding such a powerful adjuvant to life, as the last should have been, he died in the Hospital of St. Sebastian, at Salzburg, 1541, in the 48th year of his age.

From this short sketch of his life and character, it is an easy matter to conclude that he was virtually an impostor,—without moral character, without any religious creed,—whose endurance, by the world, is only attributable to the startling and extraordinary success, which at times, attended his practice. We look at him with no desire to extenuate, or cover over, one of those stains which stand out so boldly in his character;—yet, with all their hideousness, we say the man did more for the cause of Chemistry, than any man of his day.

The world, prior to his time, recognized very little use in the study of Alchemy, or its child, *then* in swaddling clothes—Chemistry. He insisted upon its being absolutely indispensable to the physician, in the treatment of disease, and showed that many substances could be so altered by fire and Chemistry, that their properties might be changed from those of an injurious tendency, to such as would be advantageous to the living economy.

From this fact alone, which was setting old notions and modes of practice adrift down the stream of oblivion, an impetus was given to medicine, now telling with force, throughout the whole civilized world. Man was never created to follow any routine blindly; and though for centuries he may be induced to do so from habit, a deliverer will come who will teach him to throw off the galling yoke, and with the quizzing *cui bono*, induce him to investigate the reasons that forced him ever to bear it. Though such an one fall a victim to his own evil passions, and thus come short of the brilliant position he might have otherwise occupied, his body will serve as a bridge from dull, hide-bound servility to antiquated notions over to full, free, investigation into the nature of things. It is but fair to see what has been attained in this age, by those who have passed from the position of slavish obedience to the dicta of a master, to that *status* of science where they proudly boast themselves *nullius addictus jurare in verba magistri;* and though their passage over may have been by a bridge, with no attractive exterior,—nothing to please the eye or gratify the taste,—still it demands all the credit for the facilities it has afforded.

From the time of Paracelsus and his disciples, down to the present day, medicine has yearly drawn heavy draughts on Chemistry, to elucidate the mysterious operations of the human system. The operations of digestion,—consisting in the conversion of heterogeneous articles of food into a homogeneous mass,—has been explained by the action of chemical re-agents. Respiration merely performs for the blood the part of separating one gas and substituting another. Secretion is also based upon chemical laws. Thus many of the complex series of phenomena, which united are considered as life, are purely chemical in their character, and though they *cannot* be imitated out of the body without the presence of living, organized matter, yet, their character is thereby not affected in the least. It is true, the operations of the vital laboratory cannot be considered synonymous with those carried on in our laboratories with lifeless material, yet the former may be explained by the latter, both directly and by analogy.

The operations of a laboratory will go on, so long as the requisite materials are present in proper quantities, due regard being had to the necessary presence of heat, light, electricity and moisture. Affinity will show her mysterious changes, colors will lose their brilliancy, and the form of substances be changed from solid to liquid,—from liquid to gas,—or the opposite, as the abstraction or absorption of heat may take place. Now these effects will be produced, without being held in abeyance by any power, save those just mentioned—heat, light, electricity and moisture. With the operations of the living laboratory it is quite different. They are kept within certain bounds so long as life, or even health lasts, and only act in strict accordance with their legitimate chemical properties, when the vital spark has been extinguished. The changes after death, thus produced by the action of decomposition, in accordance with chemical principles, is noticed by Baron Cuvier, as follows: "* This separation of the elemental constituents of the body is the natural effect of the action of the air, humidity and heat; in a word, of external matter upon the dead body; and it has its cause in the elective attraction of those different agents for the elements of which the body is composed. That body, however, was equally surrounded by those agents while living, their affinities with its molecules were the same, and the latter would have yielded in the same manner during life, had not their cohesion been preserved by a power superior to that of those affinities, and which never ceased to act till the moment of death."

Now Paracelsus first directed attention to this chemical explanation of many functions of the human system, and very rightly endeavored to govern them, when acting abnormally, by means of chemical agents. The actual importance of the vital principle in restraining these chemical operations within proper bounds was not *fully* understood by him, but the necessity of having some principle of this kind was perceived, and accordingly he attempted to meet this want by the supposition that there existed a demon in the stomach, who presided over all its chemical operations.

The archæus, who is allowed almost the same attributes we give to the vital force, was supposed to exercise the power of abstracting such substances from the ingesta as might contribute to the nutrition of the body, and to reject such as would be detrimental. The whole process of converting the food into healthy, nutritious chyle, was superintended by him, as well as the subsequent conversion of this chyle into blood. Hence, Paracelsus taught, that when the body was diseased, this archæus must be conciliated, and his power over the chemical operations of the stomach, brought into full action. Here we see foreshadowed the necessity of giving tonicity to the system, by attending to the functions of digestion. He attributed also the curing of all diseases to this archæus—the vis medicatrix naturæ. Prior to his time, remedies were brought to bear upon disease through some supposed mysterious power they *inherently* possessed, which caused the disease to flee, as a weaker party would before a stronger on the battle field. Medicines were understood to *cure disease*, and they were administered with reference to this effect alone. The fact that nature supplies each living being with a power of recuperation, which sometimes needs assistance to *enable it* to throw off morbid matter, was not at all understood. Indeed not only does nature possess such recuperative power, but most often what we consider disease, is merely an indication of nature's activity in removing morbid matter from the system. Medicine is, therefore, given with reference to assisting nature in this operation,—the ejectment of intruding enemies from her walls;—it is an auxiliary to the vital force, and not the force itself, by which the disease is removed. This is most fitly shown in inflammation and fever, now considered as curative processes of nature,—and not its deadly enemies;—they are the means adopted by the system to remove poison from its inmost recesses. Often the invalid is not able to withstand the violence of this curative process,—the vital powers succumb and death follows. The administration of medicines, with the view of suppressing these processes of nature, would be death itself; consequently medicines are given sometimes intelligently, and sometimes ignorantly, which act by *moderating* the violence of this conflict,—fitting the system to sustain the shock and thus to attain its original vigor and health. The power of medicines is not to eradicate disease, but to enable nature to drive it forth from its hiding-places,—or to strengthen the foundations of life which disease is endeavoring to undermine and overthrow. This idea certainly was present to Paracelsus' mind, and he repeatedly declares that medicines do not cure the disease, but the archæus who presides over the vital functions,—"that he has a head and hands, and is nothing else than the *spirit of life*, the sideric body of man, and that no other spirit besides, exists in the body.

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* Lectures on Comparative Anatomy.

Another subject, with reference to which, we owe much to the views of Paracelsus, is that of the proper preparation of medicines. Prior to his time, they were concocted of incongruous materials,—some opposing diametrically the action of others,—some completely inert, and many of a disgusting character. The famed Mithridate, composed of drastics, astringents, terebinthinates, expectorants, antispasmodics, stimulants, carminatives, aromatics and tonics, along with dried vipers, constituted a compound, which had been considered specific for many diseases. This was, however, simple and unobjectionable, compared with many others in which mummies, and various other disgusting substances were exposed to decoction, and the resulting draught—little inferior in character, to the compound of the witches' cauldron in Macbeth,—was crammed down the throats of invalids. Paracelsus endeavored to obtain the active principles of medicinal agents, by means of extracts and tinctures. The quintessence of a thing, he insists upon it, should always be given to the sick, so that by its most powerful form it may induce the archæus to correct the diseased system.

The limited knowledge of the real properties of medicines, peculiar to the age, caused the propagator of this idea to fall short of carrying it out, or even of understanding it, in its full force. Extracts and essences as proposed by him, were, in many instances, mere figments of his brain. The liquor of the *moon* was supposed to have a particular tendency to the brain; and various solutions of gold and silver, were proposed for different diseases, which, considering the nature of the substances employed, must have possessed not an infinitesmal quantity of active material. The announcement of an idea, novel and revolutionary in its character, is not always accompanied by its most successful adaptation to practical purposes. The lengthy and contradictory prescriptions of the days of Paracelsus were continued down to a comparatively recent period, and were only completely removed from the practice of physicians, when fuller and more just understanding of the views advanced by him were attained and the chemical properties of medicines with their incompatibles were better understood. Indeed in the time of Van Helmont, physicians had become so reckless in their combinations that recovery was considered as "not the consequence of their prescriptions but in spite of them."

The love of Astrology and Alchemy—both implanted early in the mind of Paracelsus by his father,—was not easily removed, and hence we find that with all the justness of his views, as to the use of Chemistry in the art of Pharmacy,—he neglected its assistance in procuring remedial agents from the *vegetable* kingdom, and relied here on the doctrine of *Signatures*. From some peculiar form or color, vegetables were considered as adapted to the disease under consideration and were applied with confidence as to success. Signatures were considered by Paracelsus as of immense importance, and hence he calls for a study of the *chiromancy* of a plant, denominating the leaves its *hands*, in order to ascertain correctly its medicinal properties. A similar idea, in the following century, may have existed in

Sir Thomas Browne's mind, when he states in his Religio Medici; "* I hold, moreover, that there is a phytognomy or Physiognomy, not only of man, but of plants and vegetables; and in every one of them some outward figures which hang as *signs* or bushes of their inward forms." The believers in this doctrine endeavored to enforce its truth by the argument that these forms and peculiarities were given to plants by the Deity, who enforced upon them such mystic, external signs in order to exhibit their internal qualities and relations to disease. With this kind of sophistry, they shut up all inquiry into the reason of the doctrine of signatures, and the minds of men, on account of reverence, feared to doubt what came from such high authority.

Chemistry entered its highest sphere of duty, when it was openly declared by Paracelsus that "its use was to prepare medicines and not to make Gold." It had just begun to free itself from the dross and impurities of Magic and Alchemy, when attention was directed to it by him as a science of much importance, both for the proper preparation of such remedies as were already known and for the investigation of such new agents as might be presented to it for an examination of their qualities. In this way, Chemistry showed its good services to man, which have since been recognized by the civilized world. The medical profession universally acknowledge the utility of its study as an important subject in a medical education. It forms one of the branches taught in all their schools, whether regular or irregular, Allopathic, Homeopathic, Hydropathic or Eclectic. Tantus enim ille *non* est physicus, qui Chemicus non est," was said by *Ten Rhyne* in the seventeenth century,—writing somewhat more moderately on the subject than Libavius—one of Paracelsus' own students,—who says "Medicus ille nequit esse magnus, cui Chymia non est magna." It is now fully understood that no man can practice the profession of Medicine with that intelligent satisfaction, one should always possess, unless a certain amount of knowledge of Chemistry be included among his mental qualifications.

By the aid of Chemistry we have driven out of use the unseemly preparations, which years ago constitued the only mode of treating disease, and have substituted those composed of a few articles selected for their peculiar adaptation to the case under consideration, and so prepared that the component parts are compatible with each other and suited to the wants of the system. This was a mighty revolution in the treatment of disease and does great honor to his name, to whom we are indebted for the suggestion. The complicated prescriptions of olden times resulted from a desire to modify or mitigate the action of some of their ingredients by adding others in themselves harmless and unsuited to the wants of the patient. As the imagination had forsooth to be worked upon, substances were added which should exercise some effect on it. The number of articles, which were then subjected to protracted decoction had their activity either entirely destroyed by combination with some chemical incompatible or volatilized by the continued heat. The decoction was then filtered from this rudis indigestaque moles and forced upon the patient who recoiled from the nauseous compound. The best diagnosis under such treatment could be of no avail. And every attempt to cure this state of things seemed to make it worse, as the inefficiency or positively injurious character of such compounds did not induce them to throw them away, but only suggested to their minds one mode of cure, and that was by still adding additional articles to make them more suited to the case.

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* Religio Medici, 114.

The reform introduced by Paracelsus, has progressed slowly down to the present time, when the principle, that the simpler the compound, the more useful in disease, appears to be universally acknowledged. The way has been more thoroughly opened for the employment of the essential qualities of medicines by the discovery of the alkaloids which constitute the essence of their activity, and hence there is little or no reason at present for the administration of copious draughts of any decoction, when the efficiency of these draughts may be found in a portion of a grain of the substance itself. The discoveries of Cavantow, Setüvner and Pelletier only cleared the way for the attainment of Paracelsus' idea, that all medicines should be given in "their quintessences."

The substances which were introduced to the world by Paracelsus, as possessed of medicinal properties, are neither few nor unimportant in their character. Prominent among them, were the different preparations of Mercury, called at that time argentum vivum or quicksilver. Certain diseases, which were beyond the control of any other agent, yielded directly to the application of these mercurials. But the herculean doses, in which they were occasionally exhibited, proved too powerful for the system and many cases of death are recorded as succeeding this treatment. These were necessarily overshadowed by the few extraordinary cures occasionally effected, and which prevented the new treatment of Paracelsus from becoming odious to the people. Dr. Paris states that Paracelsus was undoubtedly the first man who dared to use mercury internally as a *medicinal* agent, "and that though Avicenna had asserted it was not so injurious as the ancients had imagined, yet he did not attribute to it many virtues; he merely says, Argentum quidem vivum, plurimi qui bibunt, non laeduntur eo." To Paracelsus must therefore be attributed the first use of the preparations of this important agent medicinally. For centuries misunderstood,—blindly given at one period for all diseases coming under the eye of the practitioner, and as blindly rejected at another, as unsuited to any form of disease,—the action of Mercury, has become more and more thoroughly understood by the profession, and in consequence *properly* appreciated. It required the lapse of years, after its introduction, before sufficient evidence could be collected for the formation of correct opinions, as to its proper therapeutical qualities. These were eventually attained, and the value of this agent, in *certain* forms of disease, is now recognized by the members of the medical profession all over the world.

Antimony, which had been largely used in his practical, and occasionally fatal experiments, on his monastic brethren by Basil Valentine, was first properly introduced to the world by Paracelsus, who was an ardent admirer of the old Benedictine monk. We are also indebted to him for the introduction of Opium.

These three important agents in the Materia Medica,—Mercury, Antimony and Opium,—were thus first introduced to professional notice by Paracelsus. There is no room for astonishment at the success of the man, though surrounded with those repelling qualities which spring from vaulting ambition, accompanied by egotism of the boldest kind, and the vilest species of immorality. The treatment of the reigning Galenical school, composed of incongruous articles, jumbled together in complicated prescriptions, and administered with all the solemnity that empirical pretension exhibits in contact with ignorant credulity, fell short of the effect it was designed to accomplish. Not even the magical incantations, which accompanied the preparation of some of their remedies, seemed to be of avail, when acute disease racked the emaciated frame, nor did the sideric influences compel the surrender of the offending cause. Hence, cases of this character, and those where chronic disease had slowly and insidiously attacked the inmost vitality of man, and by gradual approach, was reducing it to a lower and still lower *status*, were unsuccessfully treated by the Galenists. The boldness of Paracelsus induced him to exhibit the powerful remedies, which had come into his possession, and occasional cures of men, given up by other modes of treatment, sent his name far and wide over the country, and really constituted the reason for his being tolerated, when he exclaimed, that "the very down of his bald pate had more knowledge than all other writers, the buckles of his shoes more learning than Galen or Avicenna, and his beard more experience than all their Universities."

His success at this time, and under such circumstances, necessarily made him many enemies, whose rage died not as long as he lived. His boast, that he had cured eighteen princes, after the disciples of the Galenical school had utterly failed to produce any impression on their diseases, only fanned the fires of opposition, so that his conduct was closely watched by those who wished to destroy an opponent,—now doubly formidable to them, on account of his occasional wonderful success, and the crowds of partizan-admirers who continually surrounded him. Such a system of espionage might have destroyed a much better man than Paracelsus, whose drunkenness and licentiousness had almost become a proverb. His vanity had led him also to proclaim, boastingly, that he could cure *all* diseases, and could prolong human life, indefinitely. The means of effecting the latter, consisted in an Elixir, of his invention, the absolute futility of which, was very satisfactorily proved, in accordance with the account of his biographer, by its being along side of him, or in his pocket, when he died at Salzburg.

The system of dispensary practice,—or medical attendance to that class in society, which is unable to afford pecuniary compensation, is said to have originated with Paracelsus. This is a bright redeeming trait in his character. To afford relief to suffering humanity, whether able to compensate, for services rendered, in gold or not, is certainly sufficient to entitle one to the thanks of his race,—to justify his claims to be called a benefactor of mankind,—in the highest degree, a philanthropist. There are, however, two motives which prompt men to such deeds,—one entitling them to the respect and esteem of their fellow men,—the other merely exhibiting the livery of heaven to worship mammon in,—being kind and attentive to the poor, because it is felt that all this must reflect credit on them among the rich,—that it is an expenditure of labor which must eventually bring in a handsome per centage. The first motive, renders the possessor, worthy of that title by which Luke is called, in the New Testament, "the beloved physician;" the second, entitles the practitioner to the name of a mere tactician—a man of policy.

Now it is doubtful, whether such a man as Paracelsus, was ever actuated by disinterested motives, in establishing a custom, that has done so much good for suffering humanity. It is more probable, that, perceiving his abuse of the profession would prevent him from receiving that encouragement from the wealthier classes that he expected, he was induced to offer his services, gratuitously, to the poor. In this way, he would not only have an opportunity of exhibiting such professional skill as he possessed, but would, at the same time, gather around him a crowd of warm partizans, whose support would give countenance to his conduct. The exhibition of his skill would eventually attract some in the higher ranks of society, while the partizans, previously gained, would be of use in forcing the community to tolerate the invective he so lavishly poured on the heads of the physicians of his day. Such, doubtless, were the motives of Paracelsus, in establishing this species of gratuitous practice among the poor. Sown by the craft of policy, it attained for its projector, reputation and wealth,—both lost through his own unworthiness. Since that day, it has been watered by the dews of fraternal kindness, and nursed by heavenly charity, until it now stands forth one of the noblest results of man's sympathy for his fellow-man. The philanthropic spirit, which induces such attention to the sufferings of man, without reference to subsequent recompense, is like that mercy which

> "droppeth, as the gentle rain from heaven
> Upon the place beneath; it is twice bless'd;
> It blesseth him that gives, and him that takes."

The character of Paracelsus affords a striking contrast with the benefits he has conferred on mankind,—so striking indeed, that we can hardly conceive the former to have proceeded from such a polluted source. His boasted pretensions mark him an impostor and the very archetype of quackery. But we are indebted to him for the association of Chemistry with Medicine, and for the bold announcement, that the highest use of the former was to aid and assist the latter; for measurably diverting the public mind from fruitless searches after the philosopher's stone, and directing it to more rational and useful investigation in the domain of Chemistry proper; for establishing the system of gratuitous dispensation of medicines to the poor, and thus preventing a man's misfortunes from depriving him of scientific advice and remedies suited to his disease; and lastly, for that boldness with which he cut loose the cord that had formerly bound men's opinions fast to the dogmas and dicta of Galen and Avicenna, and set his profession a proper example of thinking for themselves,—debating in their own minds the justice of their predecessor's conclusions before adopting them as their own.

The disciples of the Galenical schools used all efforts in their power, to put down this bold attack on their birth-right. Since their *practice* evidently could not justify them in the eyes of the world, they were obliged to resort to force—that certain sign of a bad cause—to arrest the progress of their opponents. This they endeavored *first* to obtain through public opinion, by boldly declaring that the powerful remedies suggested by Paracelsus, and used by him and his disciples, in their practice, were poisonous. But the astonishing cures already produced by this school with such remedies, had prejudiced the public in their favor. The Galenists *then* called on the Faculty of Paris, and these gentlemen, according to Thomson, formally "prohibited their fellows and licentiates from using any chemical medicines, whatever." Not satisfied with such a general prohibition, by a decree, promulgated Dec. 5, 1603, they called upon all Parisian physicians to abstain from consulting with Turquet—a follower of Paracelsus,—because he had used antimonial preparations in his practice. The decree states: "Ipsum Turquetum indignum judicat, qui usquam medicinam faciat, propter temeritatem, impudentiam et veræ medicinæ ignorantiam." Such was the character of one of the highest authorities, representing the followers of Galen, in the sixteenth, and at the beginning of the seventeenth centuries. To brave authority so bigoted, so opinionated as this, was no small work; to stand forth and receive a thousand lances from an opposing enemy, may be considered a rash thing, and yet such an act may so deprive them of weapons that a thousand can then rush upon the enemy and take the field. Peril of this kind, encountered with pure motives, entitles a man to the name of patriot; if with selfish views, he is less entitled to the meed of praise. In either case, the good done for humanity, is the *same*, though the motives for doing it be very different.

The charm of *authority* once destroyed,—the reverence paid to hoary antiquity, merely because it *was* antiquity, without considering its *claims* to our respect or reverence, once lost,—medical men once taught to think for *themselves*, and in that thinking, to discover the race was made for advancement in knowledge, and not for stagnation; these effected by Paracelsus were the low, murmuring sounds of a revolution, which gained strength day by day, until the overturn of the threadbare doctrines of Galen, and the establishment of more enlightened views of Pathology and Therapeutics,—resulting from the application of Chemistry to the study of the human system—announced a new era in Medicine.

The history of every man contains something that may be of use to his fellow-man, if its *morale* be read aright. In this of Paracelsus, we can see the danger that attends prosperity, as well as the odium and contempt which will ever be excited by vanity and self-sufficiency; we can also see the incalculable benefits that may arise from boldness and independence in attacking old errors. Though the giant of old had fresh vigor given him every time he was thrown to the ground; yet the strength of his conqueror was able to hold him up from his mother earth and dispatch him. Error, on its own ground, may flourish,—dragged on other soil, or lifted up into the purer atmosphere of truth, it is readily dispatched.

LECTURE,

INTRODUCTORY TO THE COURSE ON

Chemistry and Pharmacy,

IN THE

NATIONAL MEDICAL COLLEGE,

WASHINGTON, D. C.,

BY

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LECTURE.

GENTLEMEN:

THE progress of science, in modern times, has been such as to astonish every one viewing it from a stand-point outside of itself, while those actively engaged in effecting this progressive movement, seem hardly aware of the great discoveries which attend their daily labors. If an argument were needed to prove the progressive character of the human mind,—an idea which indeed is implanted in that mind by the Creator and dimly foreshadowed in the law which provides for the development of all organic creation from the germ to full maturity,—if such an argument be needed, the wonderful progress of science would go far to supply the deficiency. The law of progress applies to all creation: with the animal it perishes with the death of the individual; with man it does not die, in two senses,—in the one, it continues in another world, (so far as the immortal part is concerned) though, with more rapidity, hastening on to the attainment of greater and still greater good, or greater and still greater ill;—in the other, it lives on earth in the works he leaves behind him, the character of which depends greatly on the age in which he has lived and whose wants have called forth the relative faculties of mind necessary to minister effectually to them.

The wants of any particular age thus give direction to the mental labors of its great men, and as these are theoretical or practical, warlike or pacific, we find that the great works peculiar to the age are philosophical or practical, abounding in refinements of the art of war, or in the more harmonious and peaceful evidences of philanthrophy. With all this, however, it seems that, in the course of humanity on earth, there has been predominant since its very beginning an onward tendency towards a fuller development of its faculties and the productions of those fruits of mind, which afford perennial evidence of the greatness of its Creator. This onward tendency may seem at times to be retarded in various ways, and retrogression rather than progression to take place. During such intervals, strength is gained, which pushes on then with a vigor much increased by the delay. The progress has been not unaptly compared to that of a spiral where the curve, it is true, seems to return to the point from whence it started, but in fact is all the while advancing onward from that point.

Now in the spiral-progressive development of the human mind, different divisions of human knowledge, at different periods of time, seem almost exclusively to claim the attention of the race. This predominance does not take place blindly, but in obedience also to regular laws, which require that certain points should be fully elucidated before we are prepared for the attentive and serious consideration of others. There is thus a logical order, which marks the course of human investigation, not only in each particular individual, but in mankind as a whole,—an order, which is carried out most beautifully in the history of the attainment of knowledge, and which, when violated, results in the production of baseless theories and crude opinions, to be overturned by the more thorough investigations of after days. We see a practical exemplification of this, in the results attained by the Alchemy of the Middle Ages, when the attention of a few was turned to the cultivation of science, before the necessary preparation had been made for its proper study. But it must also be remarked that even a violation of such a logical order, though not resulting in the formation of *theories* likely to stand, yet it affords much that may be used when the proper time arrives for the investigation of these theories. Thus the results of these alchemical investigations have not all stood the stern tests of time, but many truths have been derived from them, and when incorporated with the knowledge of after times, they have greatly aided in the formation of more perfect theories.

The course of preparation, prior to the nineteenth century, prepared the way for the more thorough investigation of the arcana of science; and with the way thus laid open for this purpose, the student has attained a knowledge altogether peculiar to his own day, and made the century pre-eminent for the investigation of nature and her laws. That such pre-eminence has resulted *from* a utilitarian tendency of the race can hardly be said with justice, since the two are rather coincident than occupying the relation of cause and effect. We should rather say, in the development of human knowledge it had become necessary that such investigations should take place, since the domain of pure thought, cultivated for centuries, and the polemics of medieval theology and philosophy studied fully in their ever-varying aspect,—had enlarged man's views of himself and the world around him, and compelled him, after he had followed the mental and spiritual interpretation of the oracular *Γνωϑι σεαυτον*, to turn attention to its physical meaning,—to study the mysteries of his own organism and that of other beings likewise endowed with life,—the world in which he lived and the laws which govern it.

Such studies were, at first, mere gropings in the dark without one glimmer of light to direct his path. As time progressed, facts, isolated it is true, but nevertheless facts, were apprehended and a position assigned them in the store-house of memory, until at length the lamp of truth lighting up his path, he found these facts evidences of the existence of laws, and the harmonious proportions of system were given to the results of his labors. Physiology, and physical science, with its various subdivisions, gradually acquired the dignity of sciences. They have since been enriched by the labors of thousands toiling with a sincere desire to enlarge the boundaries of knowledge.

These two divisions of knowledge are of the greatest utility to each other,—so great indeed as effectually to prevent a knowledge of the one, where there is entire ignorance of the other. They are mutually explanatory. The physical sciences require a knowledge of physiology to aid to any conclusion as to the forms, matter is found to possess in organic structure, and the Physiologist labors in vain if he is not possessed of a certain amount of knowledge which the physical sciences can give him.

In every living being, must be recognized the consummate wisdom of the Creator, who has seen fit to ordain a certain harmonious adaptation of means to ends; and since this adaptation presents itself with unerring accuracy in each species, we have styled it law,—that is an expression of His will with regard to that particular species. In the words of an English physiologist:* "These laws are framed by man as expressions or descriptions of the slight glimpses he possesses of the *plan* according to which the Creator sees fit to operate in the natural world. Thus understood, the use of the term law can be, in no way, supposed to imply, that the Deity stands in any other relation to the phenomena of the universe than as their direct and constantly operating cause."

In man, both mentally and physically, there seems to be a concentration of all the wonders of creation, which the ancient philosopher, though far too ignorant to understand, considered of so much importance that he called him a Microcosm moving in the Macrocosm,—a little world, embodying all the wonders and mysteries of the great world around him. With this little world, in its physical relations, the science of physiology is concerned. In the explanation of the mysterious functions of life, it brings to its aid the knowledge of sciences that are purely physical in their character, receiving from none more assistance in casting light on these functions than from the science of chemistry. Since, however, the exact relation of chemistry is too often misunderstood, it is proposed as a subject not only interesting in its general nature, but as involving consequences of importance to our religious belief, to devote a few pages to the consideration of the *true relation which Chemistry holds to Physiology.*

Physiology, treating of the phenomena peculiar to life, in its widest sense, comprehends a description of the organs through which these phenomena are manifested,—that is, includes anatomy. Since these phenomena take place in accordance with certain laws, which are equally recognized in mechanics and in living beings, it has been the custom to attempt an explanation of all vital operations by pure mechanical rules. Acting on such premises man has been compared to a machine; and not only have poets labored to depict the excellencies of this machine, the harmonious adaptation of all its parts, and the transcendent accuracy with which its operations are carried on,—but the scientific man, forgetting all that is mysterious and wonderful in the structure of the human frame, and hence, necessarily, all that is peculiar to it as the habitation of the soul—the direct impress of its Creator,—has too often studied it as a mere machine, with a vital principle that he has improperly considered as of no more account than the main spring of a watch, or the steam generator of an engine. Such a view, however, of his wonderful habitation, so mysteriously connected with the animating principle which controls it for awhile and leaves it to decay and become loathsome to its brethren,—at one moment striving against all the destructive tendencies of nature, and at another yielding to them, and suffering all its parts to mingle with the common earth,—such a view, we say, is too low, paltry and insignificant for any but superficial observers of nature to adopt.

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* Carpenter's Introduc. to Hum. Phys.

When chemistry began to shed some light on certain of the operations, which take place within the recesses of the body,—the figure changed, and though not much used in poetry under its new form, (since poetry eschews with hearty good-will all reference to mortars and retorts, alembics, beaker glasses, and the other pharaphernalia of the chemist's laboratory,) yet, as science had aided the physiologist to explain some of the workings of the body, with enthusiastic acknowledgments, he was ready to adopt chemistry as the interpreter of all its mysteries, and it is now compared to a laboratory. The figure was more rational than the preceding one, since certain actions of life can be *imitated* out of the body if organic matter be used for the purpose, and we can thereby bring explanation to clear up mystery, and to serve as a light to guide us in after examination. But nothing is surer than that these chemical operations in the system, are continually held in check by a vital force. Indeed they may almost be considered as the destructive agencies of life, which are forever warring against its integrity, rather than the preservative agencies which build up and bind together its various parts. Again, vital actions, even when most chemical, vary either in kind or degree, from those exhibited in the laboratory, as well as in the time required for their performance. As an illustration of this, may be quoted, "The shortness of the time in which the aliment becomes acid in depraved digestion,—a series of changes being produced in a few hours, which would require in the laboratory as many weeks," and in cases of disease, "where the functions of the stomach are nearly suspended, whatever is introduced into it remains unchanged and even the nutritious mucilages are not digested."*

Fully aware of the folly of such comparisons, and not only folly, but the danger, since they induced men to build up theories on mere visionary notions, which theories impeded the progress of rational medicine by fencing it in with the whims and caprices of their authors, William Hunter is said to have spoken to his class, on one occasion, as follows: "Gentlemen, some physiologists will have it that the stomach is a mill, others that it is a fermenting vat, others again, that it is a stew-pan,—but in my view of the matter, it is neither a mill, a fermenting vat, nor a stew-pan, but a *stomach*, Gentlemen, a STOMACH."

The danger, however, does not rest in the probability that the treatment of disease may be wrong, which depends on the physician, considering the body as a mere machine or a laboratory; it goes still further, and tends to sap the foundations of our belief in the doctrines of revealed religion. He who is accustomed to overlook the origin of life and merely to view it as an aggregate of chemical phenomena, finds it not difficult to advance the notion, that life *itself* may be included under the same head, and that the vital principle is only another and more refined form of electricity, and he will not hesitate long before he considers *this* the primal creative force. Though early education may keep him from going to this extreme, yet, his one-sided examination of the phenomena of life, will lead him far in that direction. Hence, arise the daring disciples of Mesmer, and a host of other quasi-investigators, into the mysteries of life, who do not hesitate to materialize thought, and to boast a mastery over the minds of their fellows, by virtue of an electric influence which they *project* from themselves. Hence, also, arise the semi-scientific experiments of Reichenbach on Odyle, and a thousand others much less entitled, on score of mind, to respect than this veteran of science.

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* Paris' Pharmacologia, 56.

All this springs from a blind attachment to the belief, that since chemistry can aid us in the explanation of many actions of the body, therefore we must be indebted to her for a full explanation of life,—it springs from a wrong apprehension of the true relation which chemistry bears to physiology,—a misconception of the true use of the former in explaining the latter.

Chemistry, in its widest range, can only give man a knowledge of the ultimate constituents of matter, the combinations of which they are susceptible, the laws governing such combinations, and the forces thereby developed. But matter presents itself in two forms,—one called unorganized, which is gifted with certain general properties, among which is prominent what has been called vis inertiæ—a kind of indifference as to what state or condition it may occupy,—the other called organized, which presents a marked contrast to the first, from its being produced in living beings, having its condition under the control of a vital force. The first can be separated into smaller portions,—be removed from its physical connections, while the second being produced in living beings, when separated from them speedily yields to the destructive processes of nature. The first is solely governed by the laws of natural philosophy and chemistry; the second only yields to them as modified by what is called the *vital* force, which force constitutes the mystery of physiology.

The vital force, from the very inception of life—the *punctum* *saliens* of the organized being—acts in a different manner from any mere mechanical or chemical force, achieves results altogether unattainable by these latter, and is not to be explained by any analogies which may seem to exist between them and it. We can, it is true, reduce the whole mystery of animal life down to that of the existence of a single cell, which shall be absolutely microscopic in its character, and yet we will be foiled if we attempt to explain the production of this starting point of the organism by principles of either mechanics or chemistry. Its very simplicity is still too far above the grasp of mere physical science.

With bodies then made up, so to speak, of an aggregation of such cells, we must find it impossible to explain even this aggregation. Thus we find that there is a something connected with an *organism*, even from its origin, which is far beyond human ken. The very word itself—its derivation primarily from the Greek εργον—indicates its application to something which has a work or task assigned it by nature; and we find that an organism differs from a machine in being animated with one life, and requiring all its parts for its own perfection as well as for the conservation of that power in them, which prevents their subjection to the action of decay,—parts removed from the whole become dead, that is they yield to the laws which control inorganic matter; and parts removed from a machine are not changed at all in their structure nor in their tendency to decay; an organism has the power of repairing the losses of structure, which its own duties necessarily produce, and it only closes its activity when accident may check its operations, or the vital force may have accomplished the mysterious duties for which it was created; the machine gradually wears out, and in its greatest perfection, requires constant repair *ab extra*. There can, necessarily, be no comparison here. Are we more successful in our comparison, if we avail ourselves of all the discoveries of modern chemistry to illustrate the nature of that vital forçe which builds up and gives character to an organism, and then compare it to chemical action? Are the actions of organs to be explained by the doctrines of chemical affinity, or are the organic constituents governed by any such affinity? Let us examine an example. Among the organic constituents are found two, albumen and fibrine. On examination by the chemist, it is found that they are composed of the same elementary bodies, not widely differing from each other. Both contain carbon, hydrogen, oxygen, nitrogen, phosphorus and sulphur. The chemical difference does not give an insight into the different parts they play in the system. But the former acts as the material, out of which nearly all the tissues are formed, and shows nothing more than an aggregation of granules when examined microscopically. It is converted into fibrine by the vital force, and *then* we find indications of organization. How these are produced, the science of chemistry must ever fail to explain. And if we wish to make them obedient to the laws of chemical affinity, it is necessary first to remove them from the control of the vital force,—we must destroy the life which is in them and then we can subject them to the action of chemical agents. These two compound bodies, along with others, form organs having the same chemical constitution, though with widely different properties. The language of chemistry fails to give expression to the real uses of these two substances, since it is unvarying, while they are constantly changing in their properties.

This is but one instance. Instances might be multiplied to as many as there are proximate elements in the organism. They would all show as clearly as this one, that the relation chemistry bears to physiology is not that of an interpreter of the causes which originate life and the forces by which the integrity of its processes are carried on, nor of the relation of the structure of parts to the uses for which they are applied. To all, then, we can only assign the explanation that they are caused by the vital force, which is bound in the mystery that attends the origin of all matter,—a mystery not to be fathomed by finite mind.

This vital force pervades the whole range of organic life,—is seen in the monad which passes its brief existence in the sun beam,—in the vegetable, as it develops, from the small seed, bark and wood, trunk and branches, until, as the grand old oak, it extends those branches, covered with myriads of leaves, wide and far, affording protection to man and beast,—in the zoophyte, frail occupant of the seeming transition line from vegetable to animal, with all its animal endowments bound down to a mere vegetating life,—in the beast that with wonderful instinct, seeks out the food necessary for its support, and boldly defends all attacks made against its own life,—and in man, with his far-reaching intellect, enabling him to subdue all the other productions of nature, and convert them into ministers to his wants, comforts and luxuries, whose consummately-formed frame exhibits the perfection of creation, and whose mind and soul mirror forth, dimly though it be, the image of his Creator. In all this range, the vital force manifests its presence,—indescribable in words, but known and felt by us all as a something that supports and preserves the whole from the destruction that is ever awaiting all matter, and from elements warring against it and one another. Like the spirit in Faust, "It moves up and down in the flood of life, in the storm of action it weaves hither and thither. Birth and death —an endless sea—a changing woof—a glowing life,—thus it works at the roaring loom of time and produces the living garments of the Deity."

Though this vital force gives character to organic matter, yet physiology has nothing to do with its essential nature or origin. The duties of this science are connected only with its manifestations and the laws regulating them. It can effect nothing, as we have seen, either by abstract chemical disquisitions on the nature of the vital force, nor by endeavors to bring it down to the simplicity of a mere physical agency; and it can also effect nothing by accumulating facts on facts, though they be mountain high, if such accumulation only results in the formation of hypotheses, manufactured from the vague, general resemblances which these facts may bear to each other. Such induction is at best, only calculated to deceive the lover of science in his wanderings through the realm of nature,—just as the *ignis fatuus* leads the benighted traveler over bog and marsh, until he is inextricably involved, while he is laboring under the delusive hope that he is nearing a place of security and protection. Facts have an importance in scientific investigations, but they aid in the establishment of hypotheses only when the means by which they were obtained are of a strictly philosophical character,—that is when they were obtained under the guidance of a sound logic, which does no violence, in the formation of an hypothesis to the materials from which it is formed, and hence produces such hypotheses as are altogether within the bounds of scientific probability.

It is well known that, in that positive form of reasoning—the logical syllogism—though the premises may be in themselves strictly correct—that is, *facts*—yet the conclusion derived from them may be false, on account of there being no proper logical connection between these facts. In like manner will all chemico-physiological conclusions be false, if there is no true logical relation between the facts from which they are deduced.

The aid chemistry brings to physiology consists in *measurably explaining the manifestations of the vital force and its operations in the human system*, not in explaining the nature and origin of this force. This is done by her researches, into the composition and metamorphoses of tissues, into the metamorphoses the ingesta undergo by virtue of certain chemical actions, into the products of secretion, and into the chemical changes which are brought about in a pathological state of the system. To support this statement, it will be necessary to advert briefly to these points.

The composition of tissues is connected as indissolubly with the functions they are expected to perform as their form. The three, *composition*, *form* and *function*, are so connected, that it is probable, as our knowledge of the human physiology increases, we may be able with any two of these factors to give the third. Form belongs to anatomy, function to physiology, composition to chemistry.

Of the elementary bodies, the sixty-three which have thus far resisted all efforts to be reduced to simpler forms, only eighteen enter into the structure of the human frame. Of these carbon, hydrogen, oxygen and nitrogen, with a small amount of sulphur and phosphorus principally make up the structure. So long as the composition of tissues is of the normal chemical character, we have the organs which they form performing their duties in a normal way. Hence the necessity of knowing when this composition is changed, in order to judge of the effects of an abnormal composition, and to ward them off, if possible.

Whenever we recognize an organic constituent through its chemical properties in different parts of the system, whether composing tissues or fluids, we are enabled to reason as to the necessities which require its presence. In all such reasoning, we learn to recognize a positive necessity for the presence or absence of any organic constituent, and as these form the material from which the living body is formed or developed, we can trace the construction of tissues as connected with their uses, and also, to a certain extent, the nature of the metamorphoses they are subject to. The latter is a necessary subject for study, growing out of an attention to the nature of the composition of tissues. These must all, however, be studied, in full view of the fact that organic matter cannot be produced in the laboratory, and that a mysterious vital force accompanies,—guides all these operations. Reasoning, to be correct, must be chemico- physiological, as well as physiologico-chemical,—must require mere elemental constitution to understand *how* certain effects are produced, and have physiological knowledge of the existence of a vital force to understand *why* such effects occur at all. When "we have examined the origin and decomposition of a substance, we have obtained the firmest base for the explanation of the vital-chemical processes. After having familiarized ourselves with the organic substrata of the animal body, we are still only on the threshhold of the study of the composition and functions of the animal juices and tissues."* But with a firm basis for the superstructure we propose erecting, it must be seen that the composition of tissues is then readily studied and their functions made intelligible.

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* Lehman's Phys. Chem., I. 12.

As the system is constantly undergoing a waste of its particles, there must, necessarily, be some method of replacing them and of keeping up the integrity of the whole frame. Besides this necessity, there is another,—in the growing state it is absolutely necessary that the particles added shall exceed those removed. This is done by means of the *ingesta*, which are required to undergo certain metamorphoses before they are elaborated into the particular substances required for the nutrition and support of the body. These are of two kinds ; one, which is more especially adapted to the construction and maintenance of organs, forming the plasmatic material out of which the tissues are formed, and the other, composed of starch and oleaginous bodies, forming the fatty tissues to be consumed through oxidation in the capillaries for the purpose of keeping up the heat of life. These two kinds of food are of such diverse character, that physiology can trace the effects of a deficiency of either, after she has learned the chemical constitution of the food. From observation alone, independent of chemical analogies, no such results could have been attained.

The first class of food is largely supplied with nitrogen, and as it has been proved that this is indispensable to all organic matter, the conclusion is readily arrived at, that it must be appropriated to the uses just mentioned, in the body. Upon an examination of this species of food, as compared with the wants of the body, theory suggests that a deterioration of the system would result from a continued use of it alone, and, in practice, the physiologist finds this idea fully substantiated. In the scurvy, for instance, the continued use of salted provisions is found to produce that general depraved condition of the system, which constitutes the disease. There has been too large a supply of animal matter. The administration of fresh vegetable juices restores a balance in the system,—the disease disappears and the system is again restored to health.

Other items of special importance also spring up from a chemical investigation into the nature of the ingesta. Food may be so changed by incipient putridity that a small quantity shall revolutionize the whole system. Formerly this was perfectly unexplainable. Now, although the cause may be bound up in mystery, yet the effect has been traced to its cause, and organic chemistry has shown that by the introduction of a small quantity of contagious matter into the blood, it there acts as a species of ferment and corrupts the whole. From this result, attention has been paid to the subject of the depravation of the blood, and many results have been obtained, which have been made of great service in the hands of physiology.

The second class of food is non-nitrogenized and adapted to the maintenance of animal temperature. This explains the enormous quantities of fat consumed by the inhabitants of northern climes, with whom even train oil is a delicacy. The intense cold, to which they are exposed, requires a large amount of internal heat to make up for that which escapes by radiation from the surface,—hence, large quantities of fuel, that is fatty substances, must be supplied to support the necessary combustion. The same thing is seen in inhabitants of a temperate clime. During an inclement winter they eat with relish fat meats which their palates utterly eschew when the almost vertical rays of the sun, in midsummer, fall upon them.

Having thus apprehended the exact uses of this kind of food, and the nature of the changes it is made to undergo in the system, physiology then proceeds to generalize upon it and finds the application, by way of explaining the reason, that some animals are carnivorous and others graminivorous.* The former, being active in their habits, have heat generated in this way, and require food similar in composition to their own flesh, merely to repair the waste of material which their constant activity produces; while the latter, on account of the freedom with which they perspire—that is throw heat off from the surface—require material which shall generate heat to make up this deficiency, and this material is found in the non-nitrogenized substances which make up their food. From these facts, reverting to man, we are ready to explain how an omnivorous animal changes his food in obedience to the requirements of labor or the nature of the seasons,—selecting as the constant accompaniment of all his meals, when in a civilized condition, exactly such articles as combine the two kinds of food.

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* Carpenter's Human Physiology.

By means of *secretion*, certain substances are removed from the system, and others are elaborated for additional service. Here chemistry has shown the results of secretion and aided physiology in determining what may constitute the normal or healthy condition of the secreting organs, by showing her what are the products in a normal condition, and enabling her indirectly to apply proper therapeutic means when these are abnormal. Thus in pathology, which is but the physiology of disease, the relation of chemistry is that of an auxiliary, most reliable and indispensable. For though all the chemical actions, already adverted to, are under the guidance of the vital force, and hence by no means identical with operations in the laboratory, yet we can judge of the nature of their derangement by the changes which it produces in these actions. Deranged secretion itself is shown, in a majority of cases, to proceed, not from a local derangement of the secretory organs, but from a pathological condition of the blood, which provokes precisely the character of secretions, manifest on examination, being the effects of disease and not the cause. The treatment in all such cases, of course, requires attention to the prime cause of the disease.

The whole range of physiology is thus illumined by the torch, which chemistry holds up for its study. Without this light, the investigator of nature but follows blindly the sound of hollow theories, alike indicative of want of mental courage to grapple with the difficulties of his position, and of positive enfetterment in the chains of ignorance or superstition. This blind adherence to notions, which have the *authority* of the past, since that past had not the means of investigating a subject as fully as the present, is to be deprecated in matters of science. Our acquaintance with science itself is but as of yesterday; therefore the conclusions men have arrived at, before it was known at all, are of no avail, unless they shall be found true and reliable, when examined by the light of the present. Reverence for the past is indispensable in the study of theology or history, when the past constitutes a necessary link in the whole chain, or rather when it acts as the trunk from which have been developed the sturdy limbs of the present. For the past of science this reverence cannot obtain to such an extent; there is a standard of truth, becoming more and more clear and reliable every day, by which all conclusions must be tried and must stand or fall by its decisions. Indeed, to a certain extent, our reliance on this standard, shows a high regard for the past, since, *it* is not the creation of a day, but the result of truths which have been deduced from the knowledge of all time.

The very advances made by physiology, through the aid of chemistry, have, however, made its students neglect too much the mystery of that life which pervades and gives its peculiar character to organized matter. They have become impatient of having any mystery connected with the actions of the body. Hence sentiments, like the following, occur far too often in treatises of the higher order, on the subject of physiological chemistry: "We cannot rest satisfied with the mysterious obscurity in which they (viz: vital phenomena and vital forces) have been artificially enveloped. We believe, with the diffidence beseeming a genuine student of nature, that it would be wiser and more conducive to the spread of true knowledge, to adhere, in the study of vital processes, to matter, and to the laws by which it is determined, than following the fictitious abstractions of dynamical processes, to assume that there exists in life a higher power of the spiritual force pervading matter."* Nor does the averment which follows—that "our most exalted conception of nature and the sublimest natural philosophy emanate from the very simplicity of physical laws and the unlimited variety of phenomena to which they give rise," relieve such views from their positive tendency to materialism.

It is becoming then, in the man of science, not to be so blinded by the light she is shedding in his chamber, or over his researches in the laboratory, that he shall forget that far more brilliant light which streams with such resplendent rays that his mortal eyes are unable to receive their full splendor, and can only recognize their presence as reflected in the works of nature.

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* Lehman's Phys. Chem., I. 22.

As to the practical utility of a proper understanding of the true relation which exists between chemistry and physiology, it might be sufficient to say that truth requires not to be sustained by arguments based on utility, but demands to be upheld and understood on account of its own merits. Here, however, utility manifests itself so plainly, that, independent of the truth involved in this question, the medical man must see, he can practice his profession more intelligently, when he comprehends the true nature of the aids science brings to the study of man, than when by a blind adherence to science alone, he merely looks at man as a grand illustration of its principles. In practice he will find that chemical laws are subject, in the human body, to the controlling power of something, which at times holds in check, and again hastens the play of chemical affinities,—that organized matter, so long as it remains under the dominion of this something, is not subject to chemical laws, but rather sets at defiance these laws and only bows down to them when it loses its connection with the living body.

Organic chemistry needs no fanatical support to present its discoveries in a proper point of view. Such support is always injurious. It attracts *some* friends, who may be enthusiastic, but also raises up many enemies. The good, therefore, derived from fanatical support, is more than overbalanced by the evil which necessarily accompanies it.

A wide field is open for study in organic chemistry,—a field as yet comparatively untilled, bearing near the surface the richest ore in return for the labor which shall be expended in its cultivation. To follow the course of inorganic matter, first into the vegetable kingdom, where it is elaborated and prepared for the wants of the animal, then its metamorphosis into organized tissue, the functions it is capable of under this form, and finally its form and constitution when it is rejected from the organism;—to see that the highest efforts of chemistry have only succeeded in forming the *products* of organized matter, but have never approximated to the synthesis of a particle of this matter;—to see how affinity is held at bay by the force of vitality in the organs, and how coincidently with the departure of the latter it asserts its supremacy;—to examine with a careful eye to their utility the unvarying composition of the tissues in a state of health, and to mark how a change here indicates a morbid condition of the system;—to watch the progress of the life-giving blood, bearing its rich stream of nutriment to all portions of the body, and with its return current carrying off, to various points for their discharge, such particles as may be no longer needed to keep up its integrity,—these are subjects worthy of man's daily and nightly study,—the highest character of mind—the most extensive range of thought. They show that man is both "fearfully and wonderfully made." In such studies, we find that no act of life is performed without an accompanying destruction of some particles of matter belonging to the organs by which the act is performed,—that thus death is a constant attendant on life, and though an entire absence of action in the body implies its death, yet its life cannot be maintained without the death of some of its particles. Notwithstanding this continued wasting away of the organism, under favoring circumstances, neither its form nor faculties are injured, but the same power which dissevers effete particles, appropriates new material, so that the symmetry of the whole shall be kept up. This power is not found in inorganic matter. It is true, that when the latter is called upon to execute force, its particles have to change their relation to each other, but it has no inherent power to call in other particles of matter to replace those lost. This inherent power, self-constructive, self-preservative, and self-reproducing—peculiar to the organic kingdom—to that part of creation possessing life—is styled vital power, or vital force. It is a mystery bound up with the mystery of life itself.

Our subject has been chosen since it seemed to deserve careful attention at the present time. The tendency of mankind is bearing it on towards the adoption of chemical explanations of all vital phenomena. We object to this, because some phenomena can only be examined so far as the laws which govern their appearance, the nature of the cause which produces them being beyond the range of human knowledge, and because such a tendency will deprive us of our belief in anything higher than matter and reduce all our thinking to mere materialism; and in addition to these objections, there is another, the natural consequence of a tendency to this extreme may produce from reaction, one in a very opposite direction, resulting in an entire opposition to all chemical study.

The domain of chemistry is wide enough for exploration without adding to it subjects which do not belong to its proper bounds. No science so richly deserves the commendation which Davy gave chemistry—"Its beginning is pleasure; its progress knowledge; its objects, truth and utility."

THE

CHEMISTRY OF FIRE,

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THE CHEMISTRY OF FIRE.

Objects of a striking character are most apt to attract the attention of man, on account of their departure from the usual course of nature, or because they exhibit some seeming anomalous deviation from her laws. The phenomena of nature, which hourly take place, in and about him, generally fail to command his attention,—though he is ready to recognize the might of the great Ruler of all things, when bright flashes of lightning, accompanied with the pealing sound of its thunder appear in the skies above him. The little seed may show the wonderful powers possessed by its dormant vital force,—may send forth rootlets, which shall give the future plant a firm hold on the soil and enable it to gain sustenance from the same,—may develop the slender stalk and even grow up to the full maturity of a tree,—but these, being every-day occurrences, regular manifestations of the laws of the vegetable kingdom, elicit but little attention or admiration from man. Again, the animal! —comprising still more that is wonderful than the plant,—its very existence being a constant warring of the vital force against a dying tendency of its component parts,—the physiological paradox, that to have life we must have constant death,—the peculiar food needed to repair the effects of the wear and tear of the system, and the mysterious changes *it* undergoes before it can be fully adapted for this purpose,—the regularity of the Circulation, bearing in one direction a vivifying current, and in another, one surcharged with noxious prin, ciples,—the Respiration, conveying the peculiar substance which vivifies to the one current of the circulation and removing that which is detrimental to life from the other,—the closing scene of life, when the power, which presents these very mysteries as proofs of its presence, leaves the vital frame and although there may remain,

> "Before Decay's effacing fingers
> Have swept the lives where beauty lingers,"

the rapture of repose, yet the decay of the particles, which previously formed the body, making it now loathsome to those who formerly delighted in its company:—all these are allowed to occur daily without exciting more than a passing notice from the world.

Even the principle, which we call *Life*, underlying the mysteries of the plant and manifesting its presence in it by *growth*, or in the animal adding to this manifestation that of feeling and instinct, or in man, the higher power of intellectuality and will, —even this fails to attract a modicum of that attention its importance demands.

All these afford striking examples of the consummate wisdom of their Creator, on account of their harmonious adaptation to the ends, for which they were created. They are examples of the normal operations of nature. Constant familiarity with them has caused us to forget, or at least to overlook them in our daily reflections, and it is only when some remarkable deviation *from* the rule presents itself,—some Aztec or Giant,— that we pause to consider *what* constitutes the rule, and to investigate the nature and extent of the deviation.

There are many things also connected with the physical phenomena of nature, which rarely receive attention from us. Among these can be mentioned the four so-called elements of the Ancients, from which they supposed all matter was created. In the *Earth*, they saw the stable basis of the whole, applying the name to everything of a solid nature found in the planet on which we live; in the *Air*, they recognized a simple fluid which appeared to penetrate all space; in *Water* and *Fire*, two antagonizing principles, always warring against each other. This division of matter, erroneous though it be, was first proposed by Aristotle. It has challenged investigation, which has resulted in great additions to our knowledge. We do not propose to follow such investigations in the present article, but merely wish to examine the *Chemistry of Fire*,—to discuss the wonders of the simple process which we designate by this name, and the nature of the substances essential to it under ordinary circumstances. In doing this, a wide field will be opened to us, abounding in the richest treasures of science, from which we may glean some material that shall clearly show, *all is not only mysterious that occurs at rare intervals*, nor is everything or process, "weary, flat, stale or unprofitable," which belongs to the daily operations of nature.

Heat is the great repulsive force of nature. Matter of a seeming everlasting character is forced, from its compactest form, to become mobile, and to allow movement among those particles, which were bound by the strongest force of cohesion, one to the other. The Ancients, with all their innate reverence for the forces of nature, and their disposition to attribute them to the direct agency of Divinities, hailed Fire as the mightiest of the gods,—watching with admiration the spark, as it was fanned into a small flame, at first flickering, contending with feeble power for the mastery, then gaining additional force from the food on which it was feeding, and finally springing upwards embracing the combustible material in its lambent course. The bright flickering of the flames, as they played in the hearth, dispensing comfort and cheerfulness, while the chilling blasts of the wintry wind were heard howling in the darkness of the night, seemed to them like a god in his kindest and most gracious mood; while the lurid flames of the volcanic eruption, or the vivid flashes of the heaven's electricity, seemed like that same god in his angriest and most vindictive mood. Quite early indeed did the poetic mind of man detect the indispensability and importance of Heat, in the mild and vivifying rays of the sun, as it kindly enticed forth, from the hidden recesses of the seed, the radicle and plumule which constitute the vegetable, and in that animal warmth, without which life itself cannot be.

During the Middle Ages, when chemical research was in its infancy, and all investigations were found nugatory without the aid of fire, it was an agent idolized by the Alchemists. They hoped by its means to expel the moisture, supposed to be inherent to Quicksilver,—and which, when removed, would leave behind the precious metal—Silver—one of the objects of their toilsome researches. By it alone, also, they expected to obtain those potent extracts which should have the wonderful power of transmuting all things into Gold,—and which should allow Science the actualization of the power that Mythology had placed in the hands of Midas.

Fire is worshipped at the present day. The Persians are known to adore flame as a spiritual essence, constituting the life-giving and life-sustaining force of nature. Indeed this idea, with some little modification, is acknowledged as true by modern science. Though it is not considered the *primal* force, yet, under the direction of omnipotent power, it is the mightiest of all the agents selected to manifest this power. For notwithstanding Fire is to be considered as the result of intense chemical action, yet, as its immediate effect is Heat, we may look upon it as entering into the composition of all matter and determining its condition,—bodies being solid because they lack the necessary amount of heat to give them fluidity, and liquids because they have not sufficient heat to give their intimate particles elasticity inter se. In such a view, although we fail to determine exactly what may be the nature of heat or fire, we prepare ourselves to investigate the sources from which it comes.

We find it streaming along with rays of light from the sun, and, by the different angles with which it strikes the earth, producing that pleasant change of the seasons, which makes up the year,—causing the grateful breezes of the spring which woo forth, from their hiding places, sweet birds and fair flowers;—the fiery blasts of the summer's Sun, and the chilling winds of the winter. It comes also from the interior of our planet, where, philosophers teach us to believe, there exists a raging fire, producing heat of such intensity, that all matter, the refractory metals, the primary state of the geologist—the enduring granite—are all in a state of fusion,—the cohesion, that binds their particles so tightly together, as they are found on the surface of the earth, being unable to withstand the intensity of this heat. In this way we learn what may be the cause of the existence of volcanoes and mighty Geysers, which seem to project their contents forth, as from a boiling chaldron in the depths of the earth.

Heat determines the peculiar physical condition of matter. We need only refer here, by way of illustration, to the fact that, although water remains as a liquid with us at almost all seasons of the year, yet, in winter, the diminution of the external temperature (that is, an abstraction of heat,) reduces it to the condition of a solid, whereas at a depth of little over two miles into the solid crust of the earth it is probable it would fly off into the aeriform condition and be only known as steam. And this power of regulating the volume of a body, by meams of heat, is not exaggerated when we are told that it could be determined with precision "what amount of heat would be required to evaporize all the water on the globe," and "how much would be necessary to cause the whole globe itself to become vaporiform." Such calculations could be surely made, as the laws which regulate the condition of bodies with reference to heat, are fixed and determinate.

Heat is also produced by mechanical action,—driven, as it were, from a body by a condensation of its molecules, when friction or percussion is employed. Here, scientific explanation was preceded by the practice of the savage. The latter had known, for centuries before science was able to explain the rationale of the process, how, by the friction of two pieces of wood together, he could produce sufficient heat to ignite them. Many a council fire had been lighted by him in this way, and many a poor victim's life became a prey to flames which the tormentors had thus produced.

In the animate kingdom, Heat is bound up in some mysterious way with life itself; and, most important for our present purpose, it is developed by chemical action, with every phase of which, there is either a reception or loss of heat. No action, within the wide range of chemical affinity, is possible without its presence. Under this head, we include combustion, where the action of heat manifests itself with such intensity as to form the phenomenon, called fire.

For the production of Fire, or *rapid* combustion, it is essentially necessary that there should be substances which are in their very nature combustible, and one which is capable of supporting combustion. The mysterious laws, which regulate the combination of these, in the process, require that certain and definite quantities should be present, and that the combinations, thus formed, should always be alike in their constitution. Thus when wood is burned, for example, it is a fixed law, that it should be converted into products having always the same composition,—a composition which is as exactly determinable by weight as mathematical accuracy can be,—and as true to itself under *like* circumstances, as the scales of justice are in affording to man the perfect equipoise of reward or punishment for the moral weight of his actions. Here indeed in the very beginning of our examination into the nature of the Chemistry of Fire, we learn something with regard to the composition of matter, which gives us an illustration, to use the words of Griffiths, "of the Scriptural truth, that a just weight and measure are the Lord's ; that a just weight is His delight; that He comprehended the dust of the earth in a measure, and weighed the mountains in scales and the hills in a balance."

If the results of combustion were not of such a fixed character, there would be no harmony in nature's laws,—that music which, though inaudible to the mere sensualist, sounds through nature and all her works,—swells in the roaring of the wind and gently whispers in the murmuring of the breeze,—forms its accords of dulcet sweetness in the movements of the planets, and calls to its aid everything that exists, whether it be animate or inanimate,—that music would be, we say, at best but the jingling of discordant sounds, devoid of all the enchanting sweetness which now forces us to recognize it as the most positive and convincing proof that it is the voice of the Lord of all.

A most important requisite to rapid combustion is the presence of an element capable of supporting it. Such an element should exist in large quantities all over our earth, as Fire is required not only for the protection of man from the inclemency of winter, but also to aid him in all those operations, which an advanced condition of civilization demands shall be carried on through the aid of Fire. We need not refer to those processes, which the Chemist, in his Laboratory, shut out from the noise and tumult of the busy world, carries on for the purpose of scrutinizing the mysteries of nature, and, if possible, forcing her to give the key which shall reveal her hidden secrets; we need not refer to the many long days he spends in watchfulness by his Laboratory fires, justifying his claims to the title of "the Philosopher by Fire." It is not necessary to enter the quiet retreat of the student. Let us go forth into the workshops of the land, where the stalwart arm of the mechanic moulds, by the aid of fire, the refractory metals and forces them to assume the thousand varied forms his ingenuity suggests; let us watch him as he constructs, by its means, that wonder of mechanism—the steam engine—the stoutest and most useful servant to execute man's commands, and to perform with readiest alacrity the duties assigned it; let us examine the various forms which *iron* has been made to assume under the masterly skill of the workman; how, at the present time, we can judge of the position of any nation in the scale of civilization by its knowledge of the thousand useful purposes this metal can be made to serve; how, by the aid of Fire are constructed of iron, the tools of the artisan, the anvil of the smith, the trowel of the mason, even the delicate knife of the surgeon, and the multifarious machines which the farmer needs for tilling the soil, or in making its products available: all these show that if "iron may be regarded as the greatest material source of national intelligence and industry," Fire is the agent by which all its applicability to man's designs is fully and completely drawn out.

The element, *essential to ordinary combustion*, is a gaseous body, called Oxygen. This combines with the elements of the combustible and forms new compounds. The presence or absence of flame depends on the intensity of this combination. The *two principal constituents of all combustible bodies*, are substances called Carbon and Hydrogen. It will be interesting to see, to *what extent*, these three elements, so necessary to fire, are distributed over Nature, and also *why it is*, that the two which form the essential constituents of all ordinary combustions, are the only elementary substances especially fitted for this purpose, on account of the peculiar changes they undergo, which result either in the formation of a substance not injurious to life, or of one which, from its peculiar constitution as a gas, is readily mingled with the great ocean of the atmosphere and by vast dilution also rendered innocuous.

Oxygen is the most widely distributed of all the elements, forming, in its combinations, at least two thirds of the whole earth; entering into the structure of organic bodies; into the composition of the waters which lave great continents, with their dashing billows or gently meander through grassy meadows; and into the formation of those mighty mountains, which, uprearing their summits as if in defiance of the wasting effects of time, give the beholder the idea of illimitable duration. And we find it not only in these, but in the atmosphere, as an indispensable constituent, penetrating all its parts, and bearing the same ratio to the other constituents wherever we investigate its composition. We are unconscious of its presence, because that presence is required for the perfect carrying on of the functions of life; and thus, its condition, though apparently passive, retains in ever fresh activity all the world about us.

The process of Respiration in the animal, depends on the presence of Oxygen, and is at most but an arrangement by which the system can be supplied with sufficient quantities of it to combine with and burn out, as it were, such particles as are no longer of utility in the system. The process is necessary for this *slow combustion* in the system. Every motion of the body requires the removal of some portion of the living frame work. The same law holds here, as in Mechanics, "that for any given effect, there is a consumption, a change of state, of a definite proportion of some material element." This change of state is produced, in the body, by the slow combustion in the capillaries—the furnaces of the animal system—of certain substances which are composed mostly of carbon and hydrogen in varying proportions. All acts of life, then, are mysteriously connected with the presence of this bland supporter of combustion. Wherever we find vital force, we find the physical condition of its presence is, that there must be consumption of some part of the frame work in which it dwells. And this holds good throughout the whole range of organic life, whether we view it as the monad, of ephemeral existence, or in man with his reflecting mind and responsible soul. Throughout the whole range, the distinctive marks, which separate vitality from mere mechanical action, are dependent on the change of matter which is brought about by its combination with Oxygen gas; and although we are unable to perfectly explain, by theory, yet we know, experimentally, that the relation existing between vital force and the consumption of organic particles in the living body, is a direct one. The laborer who depends on the work of his hands for the support of himself and family, requires, in the pursuit of his daily avocations, the consumption of more organic particles, than the student whose physical labor is light; the former feels this keenly in practice, as the hours for his meals approach, and with an appetite, altogether paradoxical to the latter, eats with zest the amount of food necessary to make up for this previous consumption. This consumption of particles goes on as long as life lasts. The demands are, that, for every vital act, there must be a coincident death of some particle belonging to the system in which the vitality is manifested. All parts waste away under the influence of Oxygen, since to have action, energy, life in the whole, such sacrifice of the parts must take place; and, if, as is very briefly expressed by a scientific writer of the present day, " no means are at hand for repairing these daily and hourly losses, the individual perishes—dies more slowly, but not less surely, than by a blazing pile, burned at a low temperature,"—all the constituents of the body disappearing in succession, till at last " the substance of the brain becomes attacked," and reason tottering on its seat, " madness and death close the scene."

But though means should be at hand to repair these losses, if the element which produces them be diminished, we shall find that, with each successive respiration, the demonstrations of vitality will be diminished, until at last the whole series of results, which demonstrate its existence, will close and death take place. The actions essential to vitality are destroyed, because the combustion necessary for their production is checked by the absence of the Oxygen. (It will be understood we are all this time not endeavoring to show that the vital force is synonymous with chemical action; but that the former manifests its presence in this way, and selects combustion as the means of generating physical force.) If we confine an animal in any place, where the atmosphere is not renewable from the great ocean of air around us, every breath it draws, deprives this atmosphere of its life-sustaining power; the animal languishes and dies. The system is crowded with the results of previous combustion of its particles. There are no means by which they can be removed. The blood flows sluggishly along the sides of vessels, through which it should course gaily. Stagnation of the blood takes place and with the checking of its current, there is a checking of life itself.

If this experiment be tried in a closely-confined room, in which a crowded assembly has been collected, weariness and lassitude are produced, and each one feels, as he leaves the room and breathes the pure air, the vast difference between the free reception of this grateful stimulus and the limited quantity he has only been allowed to inhale in the room. The respiration of the crowd has gradually removed the stimulating material which is required to keep up a slow combustion in the body, in order that the conditions of vigorous health may be preserved. An examination of the composition of the atmosphere of a close room with a crowded audience, before and after a Lecture in the Sorbonne, showed that as much as five proportions of Oxygen had been removed by this means in the space of an hour.

As life cannot be preserved under circumstances of confinement, in an atmosphere containing a limited quantity of Oxygen, so active combustion or fire cannot take place. In a vacuum it will be immediately extinguished. Where the supply of Oxygen is limited, the flame will become dim, and flickering faintly will soon cease. Hence the same element is indispensable to both; while allowed free access to the living being, or to the burning substance, we have the phenomena of life or of fire so long as the material on which it feeds is supplied it. In the one case this is determined by a law which regulates the existence of the organic being ; in the other, by the amount of material afforded for the combustion.

But if life be dependent on the presence of Oxygen, and if combustion cannot take place unless it is present, it is a fair and rational supposition, that where the quantity of this element is increased beyond the normal amount, combustion would increase in vividness and rapidity, and the operations of the animal system would be carried on with increased vigor and activity. Such a supposition is proven to be true, when the chemist experiments with it, in a state of purity, as to its effect on life and combustion. When an animal is immersed in an atmosphere of pure Oxygen, the effects of the latter are too stimulating, and the result is inflammation and speedy death. Hence it forms only a small portion of the atmosphere, being there diluted by the presence of four times its weight of another gas, whose office seems to be only that of a diluent. If the atmosphere were composed of pure Oxygen, the animal creation would speedily perish from over stimulus ; the phenomena of life would be produced in so heightened a degree that death would speedily close them. In the words of another, "as a candle burns brighter in Oxygen gas, and is more quickly consumed, so in this gas the flame of life would be more vivid, but would be sooner burned out."

Notwithstanding the constant demand made on the atmosphere for Oxygen, there has been no change in the composition of the former, since the first appearance of human life on the face of our earth. An analysis of the air at present would furnish nearly, if not quite, the same component parts, as existed in it centuries ago. By suitable provisions of Providence its deterioration has been prevented, and the element, so essential to the preservation of life and to combustion, is now as widely distributed as in the remotest period of history, and will so continue for ages in the future. Independent of the means existing in the vegetable kingdom for supplying it, a French chemist has made a curious calculation, which shows that "the earth might be peopled with a thousand million of men, and animals equivalent to three thousand million of men, and yet these would not together consume, in a century, a weight of Oxygen equal to that of 16 cubes of copper, 3.273 feet by the side, while the air would contain 134.000 of these; and indeed that it would require ten thousand years for this number to produce any sensible effect on the great body of the air," so that chemical or electrical analysis could detect the change of composition.

Many agencies are at work to prevent an accumulation of impure substances in the atmosphere, freeing it from the impurities which have been combined with its Oxygen, and thus liberating the latter. Among these must be mentioned, as of first importance, the vegetable kingdom. In the Laboratory of the leaves, under the chemical influence of the solar beam, the purification of the atmosphere goes steadily on, from the first greeting the plant receives from the sun's rays in the morn until, in the borders of twilight, the last lingering ray leaves it for the purpose of visiting other plants in other climes. During all this time the chemistry of nature is at work. The Laboratory of the leaf is busied in furnishing supplies of Oxygen for the maintenance of animal life.

> "From its inmost cells, each leaflet pours
> In vital currents through its myriad pores,
> To renovate the air, by tempest hurl'd
> From pole to pole, around a freshen'd world."

But Oxygen does not only exist in the gaseous or liquid form; it also enters in the composition of the geological strata, which form the firm basis of our earth; into the constitution of the solid silica, and there, though immured, as it were, within rocky walls, still possessing the same properties as when floating in the passing breeze or forming a constituent atom in the foaming billow. Its range of combination with other substances is quite extensive, required by each of the three divisions of nature, and its place not to be supplied by any other of the sixty two elemental constituents of matter. This universality of diffusion, shows the wisdom involved in its selection, as the universal supporter of combustion. If the world should be deprived of it, retaining, however, its present constitution, the higher animals would cease to exist, and vegetable matter of a rank character would cover the earth. Where beauty and grace are now seen to deck the meadow and hill side,—dark, colored vegetation, with a lurid glare, would alone meet the view. Creation would lose the highest manifestation of its Creator's power in the fact, that its master-piece (man himself) could not live to enjoy, and, as it were, bring out the significance of the whole. The grand end and object of the whole, the glorification of the Maker, would be prevented, by the impossibility of a living soul being present to render thanks and honor for the varied beauties of creation.

We shall find by reflection that our theme is not devoid of its poetry as well as of its general interest. Who has not felt his imagination awakened, as he has watched the open fire on his hearth, and in its changing flame, pictured weird figures of terror, or those charming phantasies, in which the mind at times delights to revel? Has not the light, dancing on the wall, chasing fitfully the darkness away, obedient to the longing wishes of the dreamer, assumed the forms of the distant and the loved, while all unconscious of the present, he has again lived over joyous days in the past, when from unbeclouded skies, the sun of peace and happiness shone brightly over his path, or when, perhaps, mid storms of unrest, he battled against the might of oppression and injustice. There is a witching sweetness thrown around these hours of revery; a joyous freedom from the trammels which bind men to things of time and sense; a bliss whose greatest climax is attained amid the fullest serenity of the human mind.

We have seen that the element essential to fire, as its supporter, is widely spread throughout nature; the nature of the two principal elements of all common combustibles remains yet to be examined, as well as the nature of the products which result from this process: the last of which subjects will conclusively show, that no other two elements would have answered for the purpose in the present constitution of matter.

The element, *Hydrogen*, is widely diffused throughout the organic and inorganic divisions of nature. The substance which contains it in largest quantity, is water, of the volume of which it constitutes two-thirds. Its distribution is, therefore, immense; the vast distances, separating continent from continent, are occupied by this bland production of nature. In gushing streams it pours forth from the mountain rock, or in little rills it trickles down the hill side, bearing life and vigor to the parched vegetation of the plain; it comes, in spring, in gentle showers from the vapory clouds ranging in the sky above us, or from the storm clouds of summer, amid the play of heaven's electricity, it dashes upon the earth. View it in the placid lake, when no breeze ruffles the smooth and tranquil surface; the depths mirroring forth the forest trees that fringe its borders, giving the semblance of forests below, for the sportive amusement of old Neptune's subjects, and when perchance the swiftly-fleeting clouds reflected from its surface, as they chase one another across heaven's blue expanse, may be the only seeming disturbance to its tranquility.

View it again, when its waves have been lashed into the fury of a giant, under the influence of the driving storm; see how that consummate piece of man's handicraft, the steam-ship, with all its might, is rendered as helpless as an infant in the hands of a giant. Contemplate it with wonder, as under the direction of the bold Fireman it checks the ravages of the agent we are now considering, when crackling flames are fast destroying the beautiful works of man, and imminent peril is threatened to the unconscious slumberer; when the terrifying cry of *Fire* meets his ear in the dead of night, and the suffocating smoke, with the glaring flames, falls upon his opened eyes; when death, by the most awful torments known to man, seems grinning his ghastliest smile in the midst of the bewildering wall of flame which surrounds him; and then, see the conflict between the flames and the torrents of water, how, at first, the water seething and vaporizing, seems to lose all power when in contact with the destructive element, until torrent succeeding torrent, the imprisoned sufferer awaiting death, sees destruction removed from his path; the way is opened and life again smiles cheeringly at him. Here we see water, as a mild agent, perfectly passive; again a giant in strength and activity; and again coping with the destructive agent of nature and gaining the mastery.

But these are not all the purposes to which it is devoted in the mysterious economy of nature. It enters into the composition of all that has life, constituting the basis of those fluids which permeate all parts of animated structure. Deprive the latter of the presence of water, and there is only left a moiety of its former weight and none of its characteristic life. Even in man, however, it finds an use, independent of the mere support of the animal system, since the very language, with which extreme grief or joy is expressed by him, requires the employment of—Tears. In the chaste description of an English author,* the tear in the beautiful eye of a child may thus be traced:

"It was distilled from the primeval seas, it rose into the air, formed a cloud in the dark drapery of heaven, and was returned to water the rose and fertilize the corn-field. It then passed through the veins and arteries of the earth, bubbled up in the crystal spring, passed in the blood through that innocent little heart, and comes now the unbidden advertisement of a child's sympathy."

The traveller over the scorching sands of the great desert, deprived of water, suffers agonies unutterable, and gladly hails even the mirage,—all-deception as he knows it to be—thinking that by feasting his eyes on the sight of purling brooks he can banish, for the time, the agonies of his thirst. And the idea of this species of suffering is intensified in the highest degree when the instructive parable of Holy Writ sets forth to us the tortures of another world as of such a character that "not a drop of water can be obtained to cool the parched tongue."

But in this very water there is, as already stated, the element essential to combustion, united by close chemical affinity with Hydrogen—one of the two principal components of all ordinary combustibles; and the burning of the latter wherever found, if a sufficent quantity of Oxygen be present, again results in the formation of water. And thus we can imagine the immense amount of aqueous vapor thrown, in this way, daily into the atmosphere ; how the balance is kept up between the organic and inorganic world, since vegetables absorb this water from the air and the soil in which they are planted, retain it as the means of communicating, throughout their branches and leaves, the richly-elaborated substances which form new structure, and yet, on being exposed to the action of fire they give up this water again to the great store-house, from whence their constant draughts have removed it.

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* Dream of Geology, 66.

The Hydrogen of a combustible in burning forms the blandest and least injurious of all the products of nature. How could art or science, with all the aid the discoveries of a century have furnished them, have selected any substance, any element that could have answered half so well, as regards its wide distribution throughout the vegetable kingdom, the ease with which it combines with the supporter of combustion and the innocuous products that result from such combination? Is this not a wonderful illustration of the wisdom of that creative power which made a process, in all its parts, so well adapted for the preservation as well as the protection of animal life?

If the combustion of the element Hydrogen results in the formation of water, the latter substance should be found constituting a portion of the atmosphere, which envelops our earth. Experiment justifies such a conclusion. There is always an appreciable amount of watery vapor in the atmosphere, intimately bound up with it, and yet capable of being demonstrated even by mechanical pressure, so that an English experimenter actually made its presence manifest, in the driest condition of the air, by using a pressure of thirty thousand pounds to the square inch. To prevent an accumulation that would be disastrous in its consequences to life, we find that, by changes of temperature, this moisture is condensed, and, along with the vapor which rises from the surface of the great ocean, it descends then to the earth in the grateful showers of spring, the rains of summer, or the snow and hail of our winter. Thus it goes on its round of duty, ministering to the wants of men in a thousand ways, preserving a species of equilibrium in the great organization of nature.

Intimately combined with organic structure, Hydrogen may wait for a thousand years, the action of that chemical process which shall cause its union with Oxygen, and yet, during all that time, passive in character, it would indicate no semblance of the power which lies within it, nor would it lose this power in the slightest degree. When the moment arrives for the union of the two gases, combustion takes place, without leaving behind a product that could injure the most delicately constructed plant or the finest nervous system of the animal.

Let us suppose Sulphur had been the element selected to enter into the composition of ordinary combustibles. We know it will burn most freely,—will unite with the general supporter of combustion. But what would be the result? Would the products be innocuous to life, to say nothing of their actually being productive, after a time, of growth in the vegetable and being essential to the existence of the animal? Experience tells us, No! A gas of an offensive odor, destructive to all vegetable colors, bleaching the variegated shades of nature's garb, destructive to the vegetable and deadly to the animal, would be the consequence. Respiration would be impossible under such circumstances. Instead of the picturesque beauty of nature, a blighted scene would present itself; instead of the myriads of beings, teeming with life which cover the plain, swim in the water or float in the air, there would be no life,—but the earth would be one vast Golgotha, where all that had lived, breathed and suffered would be gathered in death from the pestiferous effects of this deadly gas. Nature would lose her very significance, since *without life* her highest and noblest meaning would be lost,—her grandest end and design would not be reached.

We must now hasten on to the consideration of the second substance, which enters into the composition of our combustibles. This is a solid substance called Carbon. Hydrogen, in burning, affords very little light; where illumination is required, Carbon must be added, which, from the heated condition it attains before it can be consumed and converted into the gaseous form, produces almost the entire illuminating power of every burning substance. It forms a still larger proportion of the constitution of combustibles than Hydrogen. The consideration of its origin, place in nature and influences on the progress of civilization, would require far more space than is allotted us in this article,—but would afford an opportunity for presenting, in a connected form, some of the most attractive objects of study.

It is found largely distributed over both the organic and inorganic kingdoms, though originally belonging to the former. It is removed from a gaseous constituent of the atmosphere, called Carbonic Acid; this undergoes decomposition under the chemical effects of the light of the sun, the Carbon is retained for the structure of the plant, while the Oxygen, which in combination with it forms this acid gas, is given off again to enter the atmosphere. This process goes on wherever there is vegetation. The distribution of the element Carbon, though obtained by this comparatively slow process, is very great, and presents it in many different forms. If we divest wood of its Hydrogen and a number of inorganic substances taken up from the soil, we have left behind Carbon, in the form of *Charcoal*, constituting from fifteen to twenty six per cent of the original weight of the dried wood. Again, we find it laid up, as a species of mineral, in the great vaults of the earth, for the uses of mankind, and *Anthracite* is the name given to another form of Carbon. We find it in the material which the artist uses to give permanence to the forms that an educated perception of the beautiful produce in his mind, and Carbon is here known as *Plumbago.* Under another form, not black and repulsive in its appearance, but resplendent in its lustre, the object of grasping avarice and the delight of gay votaries of fashion, it appears as the brilliant *Diamond*; the synonyme of grandeur and high state; the Koh-i-noor among objects of wealth and beauty. Yet in all these forms, whether as Charcoal or Anthracite, which hide under a black and repulsive exterior, the material that under the effects of combustion is able to give activity to the steam engine in its application to the thousand purposes for which the ingenuity of man has used it, from the distribution of the products of commerce by the mighty steamship, to the publication of the products of mind by that enormous lever of the world, the printing press; or in the form of the Diamond, which bedazzles the eyes of the spectator as it crowns the brow of beauty; under these varied forms its constitution is always the same. When exposed to heat it will become incandescent—throw off light and heat, and burn; the coal no more readily burning when kindled in our grates, than the diamond when heated in an atmosphere of pure Oxygen. The products of this combustion, being gaseous, are speedily removed by dilution in, and mixture with the great mass of the atmosphere. If this were not so, "the solid results of combustion," says Farraday, "the ashes, so to speak, would have fallen like a mantle on every earthen object; light could neither have emanated nor been seen; the economy of nature would have been embarrassed, clogged for want of agencies to remove the results of combustion, and all living things would have died.*

But whence come the immense coal-beds, which underlie many districts of this country? How can it be possible that such an immense quantity has been collected from the vegetable kingdom, that one hundred and thirty three thousand one hundred and thirty two square miles of coal formation are supposed to exist in the United States, and eleven thousand eight hundred and fifty nine in Great Britain?

It is now proven beyond the shadow of a doubt, that Anthracite was originally formed by vegetable structure. The microscope examines its intimate construction and finds undoubted vegetable cellules, and the exact moulds or impressions of plants are also often found in the thickest portion of its structure. Modern science has also shown that these impressions might be produced in an artificial way; that by exposing leaves, imbeded in clay, to a red heat, a carbonaceous product was obtained very similar to the fossil leaf presented by nature in her coal beds. But the character of the vegetation which produced the fossil leaves, the immense periods of time, through which the vegetable matter must have slowly accumulated and the forces by which it was completely carbonized (the other constituents in the mean time having been removed by slow combustion,)—these are subjects, on which we can speculate only with the greatest wonder, considering them the results of gigantic power.

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* Farraday's Lectures, pp. 277.

If Carbon is separated from the atmosphere by the vegetable creation, it is manifest that the composition of the atmosphere in the ante-historic periods of the world, must have differed from its composition at present, as such enormous beds of coal could not have been separated from it without producing great changes in its constitution, and an atmosphere largely impregnated with Carbonic Acid, could not have permitted any human being to have lived and flourished on the globe, since large quantities of this gas are fatally pernicious to life. Hence, without straining the argument at all, we must consider this whole process of Carbonification to have taken place during that period of time, which, in the simple and sublime language of the Mosaic record of the creation, is called "the evening and the morning of the third day,"—before man was created, before the perfecting of Creation had been accomplished.

The forms, however, of the plants of that period, learned by us in our examinations of the impressions found in our coal strata, were different, both in kind and size, from the forms of those which belong to the present period of our history. Where science even detects a resemblance in some of the vegetables of the present day to those enduring *Lithographs*, which nature has made of the plants of her infancy, the resemblance seems more like that of the Lilliputians of Gulliver's first voyage, as compared with the giant Brobdignagians of his second. As to the ante-historic period of the coal formations, we may truly say there were "giant plants in those days." If we could transport ourselves back, beyond the period of our own records, to that period, much would be found to astonish, yea, even to bewilder our unaccustomed eyes,—a wilderness of vegetable growth altogether unknown at present, would present itself, and in those giant solitudes, where vegetation was unchecked by the limitations of the present day, the beholder would gaze with the stupifying astonishment that an inhabitant of some distant planet would probably exhibit, if on a visit to our earth. The author of the "Old Red Sandstone," in his imaginary visit to this geological period, has well depicted, and, we think, not with extravagance, what would probably have met the eye. On the banks of streams, bearing "seeds and ferns and cones of the pine of gigantic size," he sees "an amazing luxuriance of growth. Scarce can the current make way through the thickets of aquatic plants that rise thick from the muddy bottom; and though the sunshine falls bright on the upper boughs of the tangled forest beyond, not a ray penetrates the more than twilight gloom that broods over the marshy platform below. The rank steam of decaying vegetation forms a thick blue haze, that partially obscures the underwood. Deadly lakes of Carbonic acid gas have accumulated in the hollows; there is a silence all around, uninterrupted save by the sudden splash of some reptile fish that has risen to the surface in pursuit of its prey, or when a sudden breeze stirs the hot air, and shakes the fronds of the giant ferns, or the catkins of the reeds. The wide continent before us is a continent devoid of animal life, save that its pools and rivers abound in fish and mollusca, and that millions of the infusory tribes swarm in the bogs and marshes. Here and there too, an insect of strange form flutters among the leaves. It is more than probable that no creature furnished with lungs of the more perfect construction, could have breathed the atmosphere of this early period and lived."

From this luxuriant growth of vegetables the material was obtained for the vast coal formations already noticed. They grew to their full height, and then made way for similar plants of the same species. The stratum of vegetable deposit thus increased through thousands of years, it may be, to its present thickness, when by some sudden revolution of nature, some mighty inundation, bearing along with it material from distant hills, this vegetable deposit was covered up from sight. In the process of time, a like meadow, rich in these tropical productions, may have been formed on this deposit, and another rich stratum of vegetable material obtained, to be covered up, like its predecessor, by some great revolution in nature. Then came the *Carbonization.* Under the joint action of immense pressure and moisture, a species of smothering spontaneous combustion ensued; the other elements of the plants were removed and the Carbon was left behind, forced into the compact mass we know as *Coal.* In passing through coal regions, especially where rail-road cuttings have been made, the coal strata will be often seen divided from each other by deposites of clay, slate or aluminous rocks, and thus; from their position, forcibly supporting the idea just expressed as to their formation. They look like tomb-stones placed over a race in the vegetable world, now past and gone; but they are suggestive to the human mind of the idea that He who made them must have possessed the very sum of wisdom, thus to cause the very decay and death of the plants of an ante-diluvial world to minister to the wants and comforts, as well as to aid the energies of those destined to flourish on the same world, in post-diluvial times.

The vegetation of this particular period answered another grand end in the economy of the universe; it prepared the way for the reception of a higher order of animate existence, by removing from the air that very substance which would have been fatal to all of that class; it made the earth habitable for beings created in the fifth period in the course of creation—"the beast of the earth after his kind, and cattle after their kind, and every thing that creepeth upon the earth after his kind," and also man made "in the image of the Deity and after His own likeness." The mind is lost in wonder, when it attempts to apprehend the grandeur of the process; extending through ages, preparing the way for the entrance on the stage of Time of the greatest wonder of all—MAN, himself. All the gorgeous visions which imagination has pictured as belonging to the wonders of Fairy land; all the gigantic works of fabled Genii sink into insignificance, when compared with this wonderful reality.

But to return to our subject; Carbon, whether furnished from these immense coal-beds or from the wood of the forests of our own times, in the process of combustion, unites quietly with Oxygen and forms a gaseous substance, already mentioned as Carbonic Acid. Now though this product is not as harmless to life as the water which is formed by the combustion of

Hydrogen, yet on account of a property peculiar to gases, which enables them to diffuse themselves through each other in despite of their gravity, until their noxious properties have become extremely attenuated, this Carbonic Acid gas, though much heavier than air, is diluted to so great an extent that it is rendered innocuous. It is as free from odor as water itself, and its swift dilution by the atmosphere prevents any ill effects from its presence. This very aptitude for dilution, and its freedom from any deleterious power or odor, when diluted, constitutes the special merits of Carbon as a combustible. If it were an odorous gas, like that produced by burning Sulphur, already noticed, although it might be diluted so as to have its poisonous properties prevented from acting on the system, yet the odor would render the atmosphere altogether intolerable.

Just as common combustion forms Carbonic Acid because there is sufficient Oxygen present for this purpose, so also that slow combustion which takes place in the system, produces Carbonic Acid, which is thrown off, by every expiration from the lungs. And this illustrates the innocent character of this gas, when present in a diluted condition. It comes into contact with the delicate tissue of the lungs and produces no injury; is continually bathing their minutest cells without altering their structure. There is no substance, except Carbon, which would answer these purposes; serving through slow combustion in delicate capillaries, to keep up the heat of the animal, and forming a product which passes quietly out of the system without injury, in the slightest degree, to its most intimate structure.

The amount of Carbon thrown off from the body, through the process of respiration, is almost incredible; making as much as 13¾ ounces per day from the adult. This is removed from the air again by the vegetable kingdom, which detains the Carbon and throws off pure Oxygen for the support of the animal. The animal and vegetable thus act in opposite ways on the constitution of the atmosphere; the former throws off that gas, which if collected in large quantities around it would be detrimental to its life; while the latter absorbs this, extracts its poisonous properties and sends forth the element which is so important to life. Thus the two portions of creation mutually contribute to each others preservation and mutually exhibit the grand compensating laws of nature.

What process invented by man, could exhibit such an admirable adaptation of means to the end, not constructed as our processes always are, of a complicated nature, employing various external adjuvants to produce the desired effect, but the relation between the means and the end being *immanent.* The elements are so intrinsically adapted to each other; the results are so little calculated to injure the slightest and most delicate created being; the whole process is one grand exhibit of an Omnipotent power, which shows its Omniscience no less in the destruction of matter than in its primal creation; a subject for study, which must impress one full as much with the idea of an overruling Providence, as the grandeur of the storm, or the glorious beauties of the firmament, when studded with its myriads of heaven's luminaries, the brightly shining stars.

If we have succeeded in showing that one of the most familiar processes of nature combines as much that is wonderful, as those which, on account of their departure from her usual course, are more apt to attract the attention of man, our design has been accomplished in this article; our promise fulfilled that we would find, in this subject, some material which would clearly show, all is not only mysterious that occurs at rare intervals, nor is everything or process, "weary, flat, stale or unprofitable," which belongs to the daily operations of nature.

The ancients had a glimpse into the true nature of this process, and, as has been referred to by Scoffern, in one of their poetic myths, they have shadowed forth the same idea that science has since developed into the form of a full and satisfactory theory. The Phœnix having accomplished the end of her existence, mounted the funeral pile, fanned the flames which were to consume her body, but not to destroy one particle, since from the very ashes she rose again clothed in all the vigor and buoyancy of youth, regenerated from the deformities and decrepitude of age. The flames did not *destroy* matter, but presented it in a new form. There was here strong belief, veiled in poetic imagery, in the indestructability of matter, when Fire even was shown to be unable to accomplish this result. And thus, in fact, must it ever be, so long as the present laws, governing created matter, are permitted to have power over it; and *when* this power ceases, and only *then*, shall Matter yield to anything like a destructive tendency,—Fire being selected by the Creative Power as the grand agent for destroying "the old things" of this World, and making way for the more brilliant and more durable things of that New World, whose limits can only be embraced in the idea of Eternity.

REPORT

ON THE

Progress of Medical Chemistry.

READ BEFORE THE

MEDICAL & CHIRURGICAL FACULTY

OF MARYLAND,

JUNE 8, 1855.

BY LEWIS H. STEINER, M.D.

CHAIRMAN OF COMMITTEE ON CHEMISTRY.

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Contributions of Chemistry to Medicine:

1.........................Pathology.
2.........................Diet.
3.........................Blood and Urine.
4.........................Materia Medica.
5.........................Toxicology and Legal Medicine.

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Committee:

LEWIS H. STEINER, M. D.
JOHN H. BRISCOE, M. D.
DAVID STEWART, M. D.

REPORT.

The progress of Chemistry has been so rapid in the present age, that it is found, by the closest student, a herculean task to keep pace with it even theoretically; but to combine an experimental application of newly discovered principles with the mere theoretical knowledge, would involve such immense labor, that each one shrinks from it. Hence we find, even among those who have devoted their lives to the cultivation of this science, but few who allow themselves to work in its varied apartments. Each wishes to select some province, in which he can hope to labor so as to command all that is known of it, and, if possible, contribute additional discoveries. If this be the case with the chemist, how must it be with him who is obliged to examine the many branches which belong to his professional studies, and to keep himself posted up in the contributions which each is making towards the thorough perfection of his profession. The physician cannot expect to be a thorough chemist; but he must be ready to avail himself of the lights Chemistry sheds on his path, and must have his eyes opened so as to recognize those lights.

The committee feel that in preparing a report on Chemistry for the State faculty, it is expected of them not to travel over the whole domain, but only that part which is specially interesting to the physician. And this is also a wide field. It would require far more space than is allowed them for this report. They, therefore, propose introducing short notices of some points which Chemistry has elucidated in the past year, which seem to them important as well as interesting to the profession.

I.

One of the problems, which the profession has been trying to solve for years, is the existence or non-existence of a local cause for the affection called Goitre. Its prevalence in certain countries for ages, seems to point to the existence of such a local cause. Thus, in France, England, Spain and Germany, this "morbid enlargement of the thyroid gland" is common in the neighborhood of mountainous districts. In this country certain localities are notorious for the same reason, and it seems "to prevail as an epidemic." Gibson quotes, from Trask, the statement, "that it is so common a disorder at Windsor, in Vermont, that hardly any female is exempt from it;" and he quotes the general conclusion as to the cause, that "it prevails in valleys at the bottom of the highest mountains, which are particularly exposed to the influence of easterly and southerly winds."* Most writers are disposed to consider the disease as "most frequent in low, damp, confined spots, where the stagnant atmosphere is seldom stirred by wholesome breezes; and where the sun in summer has great power."† M. Maumene has attempted the investigation of the cause of this disease, guided by the lights of Chemistry, and has succeeded in producing some results, which, if not absolutely explaining the cause, yet point the way along which an explanation may be obtained.

M. Maumene starts out with the idea that there is some peculiar substance existing in the water which is habitually used by those who are afflicted with goitre.‡ He considers that there is strong presumptive evidence of this, in the fact, that "successive families have been found attacked with goitre when they occupied habitations on certain streams," and that under the same circumstances, goitre has been produced in animals.

Looking at the various substances found in our streams, his attention was directed to the fluorides as those which might be injurious to health, and he determined to use an experimentum crucis, to establish or refute this idea. He subjected a small dog to a diet, which contained for each day, from 5 up to 50 milligrammes of fluoride of calcuim. This he changed for fluoride of sodium, giving at first 20 milligrammes a day and increasing up to

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* Gibson's Surgery, II, 61–2.

† Watson's Practice, 483.

‡ The Chemist, II, 95.

120. After some four months, during which period of time the dog seemed to be in perfect health, "a general enlargement of the neck took place, forming a sort of collar or swelling," attracting the notice of strangers. Five years have since elapsed and the swelling has not disappeared. Now this experiment, though not final and conclusive in its nature, yet must direct our attention to the presence of the fluorides in water as a *probable* cause of the disease. They are often present only in very small quantities, and without the attention of the analyst is called specially to them, he might neglect them in his examination. If this experiment of of Maumene is supported by additional observations on animals, we shall need a re-examination of the composition of the various streams and springs which supply the countries, where goitre prevails, with drinking water.

Attention has been directed to the origin of sugar, heretofore considered a morbid product of the system. M. Claude Bernard some years since, proved that sugar was contained in the liver of animals and in the blood taken from different portions of the body, and that it had a part to perform in the normal condition of the system. Its presence in the blood, when food containing much starch or saccharine matter was used, had been previously demonstrated. But this presence was supposed to be only the result of a superabundance of such principles in the food, and to be purely pathological. Bernard, from a series of experiments known to the profession, took the ground that sugar could be produced *de novo* from amylaceous principles, by means of the liver, which organ was most likely the originator also of all the fatty tissues. He considers that the two substances, fat and sugar, are vicarious with each other. Where the liver is forming much fatty tissue, little or no sugar is found, and conversely, where the liver is generating much sugar, it is comparatively devoid of fat. The liver is generally of an abnormal size in cases of diabetes, just as it is in the case of drunkards. In the former case, the size is due to the large amount of work it has to perform in the formation of sugar, and in the latter, to the amount of fatty tissue it is forming. Bernard goes still further, and states if the medulla oblongata be irritated, near the origin of the pneumo-gastric nerve, that the liver begins to secrete very large quantities of sugar, and artificial diabetes may thus be produced.

These views of Bernard are very important to the medical profession. If true, then the treatment heretofore of many cases of diabetes mellitus, has been directed wrongly. If the *causa morbi* be confined to the liver, and not at all dependent on the nature of the food, it becomes important that the morbid condition of that viscus should be investigated, and that a system of strict regimen, which requires utter abstinence from amylaceous food, should be done away with. It is known to every one that it is a difficult matter to deprive patients of amylaceous food. The stomach revolts against the sole use of nitrogenous material; at least in the manner it is generally given. If the treatment of the disease does not require such regimen, then surely it is subjecting patients to much annoyance by continuing it.

Figuier, in January of this year, read a masterly paper before the Academy of Sciences, in refutation of Bernard's views, which we consider an important contribution of Chemistry to Medicine, and from which we shall quote at some length. It is necessary before doing this, to show how Barnard's view *might be* sustained, and what supporters it has gained in Europe.

Lehman, in the first volume of his Physiological Chemistry, says " sugar cannot *generally* be found in the blood; but in the third volume, written afterwards, he believes with Bernard that " while the portal blood contains no sugar, or only traces of that substance, the blood of the hepatic veins is rich in sugar; and states that Schmidt has shown "sugar is a normal constituent of the blood of cats, dogs and men."* In the first volume, he distinctly states that in a normal state no sugar finds its way into the urine, and proves this by experiments made upon himself; but even there and afterwards, he is willing to admit that it *may* make its appearance in the urine voided, under attacks of other diseases besides diabetes.

Lehman, in a paper published in the May number of the Chemist for this year, also gives the results of a number of analyses of the blood from the Hepatic veins and of the Vena Porta, and considers, from a careful examination of them, that Bernard's opinion, as to the formation of sugar in the liver, is placed beyond doubt. He says that the blood, which issues from the liver by the hepatic veins, is always the most saccharine blood of the body. Bernard, in his remarks on this paper of Lehman, considers that the glucogenic function of the liver is an established fact, and states, as the only subject now remaining to be examined, the question, "what are the elements of the blood which the liver turns to account for the production of saccharine matter." The weight of Lehman's name may thus be considered as on the side of Bernard's view. Carpenter and others incline to this view:

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* Lehman's Phys. Chem. III, 467–8.

The sugar found constantly in the blood is not the common *glucose*, but another variety. And M. Bernard assumes, as this sugar, which may be the same as the variety called Inosite, (discovered by Scherer in muscular juice,) is found both in the blood of carnivora and herbivora, that it cannot invariably proceed from the metamorphosis of starchy articles of food. We must admit that where such substances form a large portion of the ingesta, as with the herbivora, that the action of the saliva, pancreatic and other juices will convert them into sugar. But where they are not present in the ingesta, then if sugar be found, we must be ready to adopt the view that it is formed from fibrin and the albuminous, portions of the food generally, according to Berzelius and Liebig.* Yet with this view, we are not obliged to hold that the liver has alone the power of causing the metamorphosis of protein compounds into saccharine matter, unless we find by actual observation that there is an augmentation of saccharine matter in the blood, which has passed through the hepatic veins, much above that contained by it before it entered them. And on this point, Figuier rests his argument, in his paper "on the origin of the sugar contained in the liver,"† and though his results differ from those of Lehman, yet we think it important, in a question like this, not to base our opinions upon the dicta of either, but to examine with care and deliberation, the results of the experiments which they have performed. He commenced his experiments by making a chemical examination of the soluble matters found in the liver. He finds that independent of the blood, these may be divided into three classes: I, an albuminoid matter, resembling Mialhe's *Albuminose*; II, glucose or grape sugar; III, mineral salts, chloride of sodium and others. With reference to the second, which he obtains by evaporating in vacuo, a watery infusion of the liver, and when nearly dry, adding pieces of caustic lime, and then dissolving it out by means of hot alcohol; and with reference to its saccharine nature, no doubt can be entertained, since it readily ferments. Thus far he only repeats Bernard's first experiment, (1848) that sugar could be discovered in the liver. He goes further however, and shows glucose in normal blood. The blood is quickly deprived of its fibrin; then the liquid portion is mixed with three times its weight of alcohol at 36.°C "After a few minutes, the blood is completely coagulated into a clod of a beautiful red, by the simultaneous precipitation of the globules and of the albumen of the serum. It is then strained through a piece of cambric muslin and pressed, and the residue is washed with a little alcohol. The liquid when filtered, passes through almost colorless, manifesting an alkaline re-action." Acetic acid is added to give it a slight acid re-action. Evaporation on a sand bath is resorted to. At first this process throws down "the last remains of coagulated albumen," and the residue contains glucose united with some mineral salts. The glucose is proven by the readiness with which it deoxidizes the copper of Trommer's liquor, giving the well known brick-red precipitate of the sub-oxide of copper. The glucose was also proven by its undergoing fermentation.

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* Lehman, III, 216–7. † Chemist, II, 346.

The result of these experiments on the blood, shows that there was in the blood of a rabbit 0.57 per cent. of glucose, while the liver of this animal contained 1.0 per cent. In the blood of the ox there was 0.48 gr. per cent., and in the blood of man 0.58 gr.

From his experiments then he finds that "the liver would contain, in equal weight, scarcely twice as much sugar as the blood contained in the other parts of the body." He accounts for the difference by the acknowledged fact, that the liver is the organ used for the depuration of the blood,—and that all the glucose arising during digestion is concentrated in it, afterwards to be sent into the circulation. His conclusion is then evident so far as regards the presence of sugar in the system, that it comes from without either as sugar, or as starch or gum which is converted in the digestive process into sugar.

He meets the question, with reference to the occurrence of sugar in the blood of carnivora, by assuming that these animals being fed on the flesh of the herbivora, this flesh always must contain in the vessels, which permeate it, blood containing sugar; and hence that the sugar was introduced from without, small in quantity, "but it was constant and the liver being an organ of condensation and accumulation as regards glucose, it is not surprising that the proof of its existence in this organ was found after death."

His conclusion is "that the liver in man and in animals has not received the function of forming sugar, and that all the glucose which it contains in its tissues comes from without, that is to say, from the nourishment."

This important subject is now being very thoroughly investigated by European students of Zoochemistry. Whichever view be correct, as to the origin of the sugar, we must not forget that this substance seems, by nature, to be intended as a transitionary condition of starch, in its conversion into fat and lactic acid—the latter being the principal constituent of the gastric fluid, and in combination with the alkalies supporting animal heat by the facility with which it is converted through the oxygen in the blood into carbonic acid. If the glucose be a transitionary condition, and its presence in the blood becomes so large that the kidneys are forced to remove it from the system,—it is a just demand, on the part of the physician, of the chemist, that he should suggest some mode of causing the glucose to advance to the stage of the formation of lactic acid. Dr. W. Bird Herapeth, in a late paper,[*] offers a suggestion that yeast or *Torula cerevisiæ* be employed to produce this effect. The Doctor says, that "glucose, under ordinary circumstances, at a temperature of 60° to 70° F would be converted into alcohol and carbonic acid by the fermentative agency of torula cerevisiæ or yeast, as is very well known to most persons; but if the action were to take place in the dark, in the presence of albuminous substances or other protein compounds, and at a temperature of 98° F., the products would be lactic and acetic acids, with possibly alcohol and carbonic acid. It is clear, therefore, that the former products would assist in the conversion of the protein compounds, as in the normal state of digestion, and would pass out of the system in combination with some alkaline or earthy base, and be eliminated by the kidneys, skin, or other emunctories; whilst the alcohol and carbonic acid would act as agreeable vital stimuli, whilst existing in the system, and could eventually escape by the pulmonary mucous membrane, after having perhaps served to assist the respiratory process, being thus converted into carbonic acid and water."

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[*] Chemist I, 568.

Acting under an impression of the truth of these views, he treated a patient whose urine (Sp. gr. 1044,) contained 850 grains of sugar to the imperial pint, at the beginning of the treatment. In two days the Sp. gr., was reduced to 1020, and the amount of sugar to 300 grs. In six weeks the sugar disappeared, and the patient recovered his health, strength, and was recovering his flesh.

The form of yeast used was that prepared on the continent by expressing the liquid article, obtaining in this way a semi-fluid mass,—of which he gave a table-spoonful in milk, two or three times daily. There is no doubt that the common yeast of the brewery would answer,—and the mode of treatment of this disease, thus suggested by chemistry, merits notice.

Headland, in an article on Diabetes, suggests "milk *just turned sour*, as containing a decomposing caseine, which transmutes sugar into lactic acid.*

For those who hold with Figuier, that the sugar depends entirely on the nature of the ingesta, which opinion, it will be recollected, was advanced primarily by Bouchardat in 1838,—it will be interesting to know that M. Durand, a baker of Toulouse, has succeeded in making *gluten* bread, which does not excite disgust in the patient, and which affords excellent nutriment.† He prepares his gluten by washing wheat flour until all the starch is removed, and by peculiar processes not given in the article by M. Durand, succeeds in making a bread nutritious and palatable. The large quantities of gluten lost annually in all our starch manufactories, might be turned to good account, if it were used in the preparation of this gluten bread which has been found not only useful in Diabetes, but as suited to cases of dyspepsia, gastritis and many other diseases.

Without wishing to occupy the time of the faculty any longer on this subject, and yet satisfied with its importance and its claims to a large share of our notice, the committee have to conclude this portion of the report, with the opinion that the origin of Diabetes, is by no means fully explained as yet—and although the experiments of Figuier seem completely to refute the theory of M. Bernard, this theory is supported by some pathological circumstances seemingly unexplainable by any other. Thus Dr. Frerichs* reports a case of fatty liver in a girl of nine years old, complicated with ascites. It was necessary to resort to the operation of *paracentesis* for the latter—and the liquid thus obtained was found rich in sugar. When more cases shall be collected bearing on this subject, we shall be better prepared to deduce our conclusions. The number of cases is too small to justify that kind of induction, which will give us the truth, freed from all possibility of error. Therefore it is expected of every medical philosopher, not to attach himself to the theory of any man, be his position and reputation great or small, unless the touchstone of experience—the experience of such as are fitted to judge of facts by their previous habits of study—shall verify the theory, and show its truth, freed from all crude and ill-digested peculiarities.

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* Western Lancet, May, 1855—copied from London Lancet.

† Chemist, II, 87.

II.

The committee think it will not be foreign to the design of this report, to introduce some of the novel suggestions, made by distinguished European chemists with reference to various articles of food now in use by man, or recommended to be used in a state of health. Hygiene is by no means an unimportant subject for the study of the physician, and diet occupies a very prominent position among the various means which are to be considered as bearing directly upon health. The distinguished chemist Liebig, has not thought it beneath his notice, to investigate the best mode of preparing a broth for the sick, which should be available in many forms of disease—especially at the commencement of convalescence.†

It seems, that "a young lady of eighteen years in his family being ill with typhoid fever," her physician, Dr. Pfeufer, suggested to the Baron that, "in a certain stage of this disease, the greatest difficulty met with by the physician lay in incomplete digestion, a consequence of the condition of the intestines, and, besides, in the want of a nutriment proper for digestion and for the formation of blood." Whenever heat is used in the preparation of broth, the latter is deficient in those constituents which are required for the formation of blood. It was desirable that the meat-albumen should be present, and other constituents not usually contained in our broths.

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* Chemical Gazette, XII, 364.

† "A new broth for the sick," translated from the German of Liebig, for the N. Y. Tribune, by a lady of Washington. Copied in the Ohio Medical Counsellor, April 7, 1855.

Liebig recommends the following receipe; "for one portion of broth take half pound of freshly killed meat, (beef or chicken,) cut it in small pieces, add to it 1⅛ pound of distilled water, to which has been added four drops of pure chlorhydric (muriatic) acid, and half to one drachm of common salt; mix them well together. After standing an hour, the whole is strained through a conical hair sieve, such as is ordinarly used in the kitchen, allowing it to pass through without squeezing. The portion passing through first being cloudy, it is again poured through the sieve, and this process repeated until it becomes perfectly clear. Upon the residue of the meat remaining in the sieve, half a pound of distilled water is poured in small proportions. In this manner about one pound of liquid (cold extract of meat) is obtained, of a red color, and pleasant meat broth taste. It is administered to the sick, cold, by the cup-full, according to their inclination. It must not be heated, as it becomes cloudy thereby, and a thick coagulum of meat, albumen and hematin is deposited."

This broth is certainly far more nutritious than the beef tea which has heretofore been used, since it contains, in addition to the gelatine of that compound, albumen, hematin, (with the iron contained in it,) and a small portion of acid which contributes to its ready digestion. Care must be taken in warm weather that it be kept in a cool place, as it undergoes a species of fermentation in the warm.

Liebig has seen this used in a case of ovarian inflammation, when the patient could not take solid food. Life was sustained for two months on this broth; flesh and strength were regained and health restored. He says that "patients generally take this food without opposition so long as they are ill; as soon as they can take other food, they reject this, perhaps owing to the color and the faint meat odor. It might be in many cases of use to color the broth brown by adding burnt sugar."

Some of the most celebrated physicians in Munich use this broth in their hospital and private practice. It seems to furnish the desideratum in certain cases where the disease has been arrested, indeed cured, but owing to the feeble condition of the digestive organs, sufficient material cannot be appropriated to meet the wants of the system, and the patient dies of sheer debility, not having strength enough to meet the varied necessities which a convalescent body requires.

Liebig has contributed a paper to the "Annalen der Chemie und Pharmacie," on a mode of freeing bread from acidity, and of making a good article from damaged flour."* Years ago it was known that the Belgian bakers formed a good article of bread from damaged flour, and indeed increased the quantity and whiteness of that which could be made from good flour, by the addition of alum and sulphate of copper. Normandy speaks of the use of alum for this purpose being so common in London, that (with but one exception) he has invariably found it in bread obtained even from bakers of the highest respectability in that city. Whatever effect its use may have upon the appearance of the bread, its presence must be detrimental, when admitted day after day with each meal, into the animal system. The rationale for its action on the bread is given by Liebig in this way, first: "all panification is principally due to the presence of gluten, which has the property of condensing water, fixing the liquid under a form similar to that under which it is found in muscular tissues and in coagulated albumen, substances which do not communicate moisture to dead bodies, although they contain water." Owing to this property, it forms paste readily with starch. When gluten is baked in the form of bread, freed from starch, as already mentioned by the process of M. Durand, it may be kept an indefinite length of time. But when kept in the form of flour it is hygrometic and attracts so much moisture as to lose its viscid character, to become soluble in water and unfit for panification. Now, the alum forms with this metamorphosed gluten, under the influence of the heat of the oven, a combination, by means of which this proteic substance recovers its original qualities and again becomes insoluble and hygroscopic."

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*Chemist, II, 343, and Journal de Pharmacie et de Chimie, xxvii, 75.

Liebig proposes to produce this effect by the use of lime, which, instead of being a disadvantage to the system like alum, would be an important addition, as it is a necessary constituent of bones. By the admixture of lime water, a light, spongy and elastic bread is produced, which is perfectly free from acid, and has such a peculiarly agreeable taste that those accustomed to its use are said to prefer to it to all other kinds of bread.

The lime is used in the form of lime water, and as 500 grammes of lime require 300 quarts of water to effect the solution, we shall find that the proportion of lime present in the bread must be quite small. The proportions of flour and lime water are in the ratio of 19 to 5, (52 litres of lime water to the metrical quintal of flour.) The flour is first kneaded with the lime water; the yeast is afterwards added; and after the panary fermentation has taken place, more flour is added to the dough before baking. The yield is said to be greater, owing to more water being taken up by the gluten, under the influence of the presence of the lime. Liebig found that 19 lbs. of flour would give 24½ lbs. of bread when kneaded *without* lime water; when five quarts of the latter were used, there was produced from 26 pounds 6 ounces, to 26 pounds 10 ounces. He concludes his article by the statement that it is "a physiological truth, established by experience, that corn flour is not a perfectly alimentary substance; administered alone, in the state of bread, it does not suffice for sustaining life; from all that we know, this insufficiency is owing to the want of the lime so necessary for the formation of the osseous system. The phosphoric acid likewise required, is sufficiently represented in the corn, but lime is less abundant in it than in leguminous plants. This circumstance gives, perhaps, the key to many of the diseases which are observed among prisoners, as well as among children brought up in the country, where the diet consists essentially of bread; in this respect, the lime water bread deserves perhaps to attract the notice of chemists."

It will be understood that by the term *corn* is meant wheat, rye, &c.; farinaceous grains used for food.

A word here may be not out of place as to the nutritive properties of bran or the husk of the grain, which is rejected in the process of bolting. This substance has been carefully examined by M.

Poggiale,* and his conclusions are adverse to the generally received opinion that its absence really deprives the meal of much nutriment matter, and that unbolted meal contains a much larger proportion of nutriment matter than fine flour. The latter position is held by Prof. Johnston, of Europe, and was supported by Prof. Lewis C. Beck, in his "report on the breadstuffs of the U. S.," made Jan. 1, 1850, to the Patent Office. Poggiale shows that the conclusions are incorrect which chemists have arrived at, because there is only from 5.73 to 9.42 per cent. of cellulose left back after bran has been treated with boiling water, acids and alkalies, that therefore all the remaining portion is nutritious. He says this remaining portion consists largely of non-assimilable matter, substances not alimentary as coloring, extractive, resinous, gummy matter, &c.

Why is it, however, that bran bread, that is bread made from unbolted meal, is prescribed by physicians "against constipation and disposition to cerebral congestion?" Mons. H. M. Mouries† quotes from Magendie the statement that dogs will live on bran bread, but will die if fed on white bread alone, and then goes on to say that this *cannot* be explained by the large amount of nitrogen contained in the proximate principles of the bran, since the latter contains but a small quantity as compared with white flour. He proposes as a solution to the question, the fact that the internal surface of the bran contains a small quantity of peculiar nitrogenous principles, which are readily soluble in warm water, and are possessed of the property of liquefying starch and changing it into dextrine and sugar. Although these peculiar nitrogeneous principles of bran, according to the showing of M. Poggiale, may not be so nutritious in themselves, yet, according to Mouries, they may have the property of hastening panification and digestion. By an experiment tried on a definite quantity (130 grammes) of bran and white bread, this fact was shown: They were respectively bruised along with 520 grammes of water, and exposed to a temperature of 104° F. for three hours. The first was divided with ease and assumed the appearance of a milky mixture; the second that of a half solid mass. When filtered, the following results were obtained:

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* Chemist I, 100.

† Chemist, I, 220.

Bran bread:	Soluble matter, dried at 212° F.,	59.35
	Insoluble matter,	69.75
White bread:	Soluble matter,	9.03
	Insoluble matter	120 25

The value of bran bread, it will be seen is not in preventing constipation by the mechanical presence of its coarse particles, but in facilitating the changes which the amylaceous portions of the food must undergo, before they enter the system, and thus preventing accumulations which may give rise to constipation.

Attention has been directed to the impure milk now sold in our cities, and various means have been adopted, both by the strong arm of the law and by the promulgation of scientific means for detecting its presence, to prevent its introduction into use. Even in its unadulterated form, we find it is mostly furnished from animals which have been fed on swill slop—which ensures an abundant secretion from the mammary glands, of such a pernicious character however that it cannot fail, when used for a long time, to produce disease. In its adulterated form, we find either pure milk or swill slop milk adulterated with a number of articles—water to increase the quantity, starch or chalk to give it a white color and a somewhat milky appearance, sheeps brains (previously well triturated in a mortar,) to give it the creamy consistence, annatto to give cream color, &c., &c. It was proposed by means of railroad communications, that the dealers in large cities might be furnished with a pure and unadulterated article. This however cannot be done in warm weather very well, since the souring of the milk by the heat makes the article comparatively valueless. For some years it has been proposed to adopt a plan, by which milk could be solidified and thus become capable of transportation without injury. This has been accomplished, and is now successfully carried on at Amenia, some 20 or 30 miles east of Poughkeepsie, N. Y., by Mr. Blatchford.

A gentleman, who was present with the committee from the N. Y. Academy of Medicine, during their examination of the establishment, in last autumn, writes a description of the process of preparation and uses to which this important preparation can be applied.* Twenty-eight pounds of Stuart's sugar were mixed with 112 lbs of milk, and a little bicarbonate of soda to counteract and neutralize any acidity that may be present. "The sweet milk is then poured into evaporating pans of enameled iron, embedded in warm water heated by steam." By means of a thermometer in the water, a fixed degree of temperature is maintained. "To facilitate the evaporation—by means of blowers and other ingenious apparatus—a current of air is established between the covers of the pans and the milk." The milk is stirred but slightly so as not to churn it. In about three hours, it assumes a pasty consistence; and, by after treatment, is reduced into a powder, which when cool is compressed into blocks of a pound weight, by means of a heavy press.

This solidified milk when dissolved in water was found to give off, like liquid milk, cream, which could be converted into butter. In every particular it seems to be equal to the best fresh milk.

The committee have introduced this subject by way of attracting attention to it, on the part of the members of the Faculty, resident in the city of Baltimore. Our milk is *probably* not as bad as that furnished the New Yorkers†—but it is too impure, as a general thing, to be employed for family use. Might not this solidified milk afford us an excellent means of obtaining an article reliable because pure—and might not the agricultural portions of our state find in the preparation of this article a fruitful source of profit to themselves as well as of benefit to the citizens of our great city?

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* American Medical Monthly, II, 315.

† The city authorities of Baltimore have recently passed an ordinance with reference to the adulterations of milk, containing the following sections:

SECTION 2. *And be it enacted and ordained*, that it shall not be lawful for any person or persons to adulterate milk offered for sale or sold within the limits of the city of Baltimore, by mixing therewith *water*, *chalk* or any *drug or* other *article* whatsoever, under a penalty of not less than twenty dollars for each and every offence, one half to go to the informer and the other half for the use of the city.

SEC. 3. *And be it enacted and ordained*, that any person or persons who shall offer for sale any milk of a *diseased cow* within the limits of the city of Baltimore, shall pay a fine of twenty dollars for each and every offence, one half to go to the informer and the balance to the use of the city.

This is taking one step towards banishing a nuisance from our community. The query, however, naturally arises as to the mode of ascertaining these adulterations. How can this be done, unless Dr. Hassall's suggestion, with reference to the adulterations of food in general in the city of London, be adopted? That is, by the establishment of a board with analytical chemists, whose duty it must be to detect adulterations and to bring the offenders under the penalties of the law.

The use of coffee and tea as regular beverages has been discussed by M. J. Lehmann, in a late paper,* with the following results; the quantity of the urine was increased by it when taken after the habit has been given up for some time, and the solid materials of the urine were notably diminished. The following propositions are deduced from some carefully performed experiments: 1. "Coffee exerts two distinct actions on the economy, which appear dificult to reconcile—augmenting the activity of the vascular and nervous systems, and lessening the rapidity of the metamorphosis of the tissues. 2. The salutary state of excitement produced by the use of coffee is due to the simultaneous action of the empyreumatic oil and caffeine. 3. The comparatively slow intimate decomposition must be attributable principally to the empyreumatic oil, caffeine contributing to this effect only when acting in rather large doses."

Dr. Bocker found, by comparing results with the use of water alone and with tea alone, that the fæces, urine and perspiration, were diminished with the latter, and the daily loss of weight by these means was not as great as when water was used alone.

III.

The journals bring us, with each month, accounts of new remedial agents, proposed to meet different therapeutic indications, and also, what is of still more importance, new facts connected with those which we have been using for years. Among the latter may be mentioned the new experiments which are being performed, from time to time, with cod liver oil. But few years have elapsed since the first proposal of this substance, and yet a host of suggestions have been made as to the cause of its action. At first it was attributed to the amount of iodine it contained This, however, was proven to be present in so homeopathic a quantity, that the suggestion militated against reason. Then it was stated, that in Phthisis, there was required some substance to supply the fatty matter which was needed to keep up animal heat by its oxidation. Hence cod liver oil acted as a combustible material, and if its only use was as a fatty fuel for the system, as the defenders of this theory boldly asserted, *any other* oil would do as well. Indeed a prominent lecturer on Physiology, some years since, warmly defended the use of all sorts of oil as equally advantageous with cod liver oil in Phthisis. These are but two out of the large numbers of theories advanced on this subject. It is pleasant to see that experimenters are now looking into the changes which this substance produces in the blood itself, and from these deriving useful data for the use of the profession.

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*Chemist, I, 287.

Mr. Dugald Stewart[*] analyzed some blood, with reference to the effect of a course of this oil, which was found, as exhibited in the following table, to increase the red corpuscles. The same quantity of blood was taken in each case:

	Red Corpuescles.	Fibrine.
First stage, before the use of Cod Liver Oil,	Female,..129.26	4.52
	Male,....116.53	13.57
First stage, after the use of Cod Liver Oil,	Female,..136.47	5.00
	Male,....141.53	4.70
Third stage, after the use of Cod Liver Oil,	Male,....138.74	2.23

The benefit of this kind of experiment consists, in its not being based upon any special theory, but being carried on for the purpose of gaining facts from which afterwards theories may be formed.

The examination of the blood with reference to changes produced in it by disease, is effecting many results important in a pathological point of view. The committee have only room here to notice one. In a case of epilepsy,[†] occurring at Toronto, the blood of the patient was examined by Mr. Stratford, in the hope of finding something that might point to the cause of the complaint. After the red corpuscles were broken up by absorbing water, a number of cellæ form bodies were found, generally ovate and which were proven to be starch corpuscles, both by their form and the chemical test of iodine. Since this case, these corpuscles have been found in the matter of *fungus haematodes*, and also in specimens of urine. What may be the full pathological import of this cannot be stated now, though Mr. Stratford suggests with reference to their form in the blood—that *there*, they may exist only as granules, yet when removed from the dense fluid (the blood) to one of less density, (water) they take up this latter fluid and then assume the appearance of corpuscles.

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[*] Chemical Gazette, XII, 275.

[†] Quarterly Journal of Microscopical Science, (January, 1855,) 168.

Dr. Hassall of England, has shown* that indigo is a more common constituent of the urine than was suspected when its presence was first detected in this secretion. Its composition consists of a large quantity of carbon and a small quantity of nitrogen. Hassall, in his communication to the Royal Society, suggests from its close alliance with haematin and urine pigment, that "it forms a vehicle for the elimination of any excess of carbon contained in the system. This view is borne out by the important fact that the greater number of cases in which indigo has been observed to be developed in the urine in large amount, have been cases of extensive tubercular disease of the lungs, and in which the decarbonizing functions of these organs are greatly impaired.

Von Sicherer† found no abnormal condition in urine containing indigo, with respect to the amount of uric acid, urea, chloride of soduim, phosphates, &c., and that changing the kind of food used, produced no special alterations. He states, that this blue coloring matter was not betrayed by mere spontaneous deposition, but was separated on the addition of nearly an equal quantity of fuming chlorhydric acid, or dilute sulphuric and nitric acid. The urine assumes gradually a reddish brown color, and the coloring substance is found as a blue froth on shaking, or as a reddish blue film on standing for some time. It is, when dry, of a blue color with a coppery tinge, sublimes at 537° F., and forms crystals agreeing in form, color and properties with those of sublimed indigo, and furnishes a dark blue solution with concentrated sulphuric acid.

Much has been done in the way of studying the properties of urine, both microscopically and chemically, during the twelve months which have elapsed since the last meeting of the Faculty. Though our knowledge of the normal constitution of and pathological changes in the urine, is by no means as full and accurate as it should be in order to attain those results, microscopists ardently predict, from chemical and microscopical examination of urinary deposits in disease—yet every day seems to be bringing us towards that point. Many of the dicta of the too confident urinoscopist will have to be recalled; but this will only open the way for a more reasonable series of theories, although they should be built at the expense of the wrecks of other theories, which were not based upon truth. New substances are now found in the urine, heretofore not discovered by other observers—among which may be mentioned silicate of iron, by Mr. Harley of England, and the spontaneous deposition of creatine without the use of any chemical tests whatever, from urine voided in a certain form of dyspepsia, observed by Prof. Miltenberger of the University of Maryland. This department is quite promising to the investigating physician as being but little cultivated, although abounding in much that is important and useful to our common profession.

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* Chemical Gazette, XII, 320.

† Chemical Gazette, XII, 267.

IV.

As a contribution to the Materia Medica, M. Thoulose proposes an infusion of roasted acorns to be used as an adjuvant to quinia, in cases of Intermittent fever. It seems that it destroys the bitterness of quinia without altering in any way its therapeutic qualities. The principle extracted from the acorn is doubtless a form of tannic acid; but the tannate of quinia formed with this kind of tannic acid is insoluble at the moment of administration and is consequently tasteless, and hence would be desirable in cases where quinia is required to be administered continuously for some days. The infusion of acorns may also contain some aesculin, a bitter principle first discovered by Trommsdorff in the bark of the horse chesnut.

Thoulouse observed that a decoction of roasted acorns diminished the secretion of the urine in such a way, as to make it quite desirable in cases of incontinence arising from relaxation of bladder, &c.

The last committee on chemistry noticed M. Melsens suggestion of the iodide of potassium treatment in all diseases resulting from the deposit of lead in the animal tissues. Dr. Corson of New York, has since published an article on this subject, which fully substantiates this plan of treatment. As a proof of the large quantities of this medicament which may be borne, one of Dr. C's cases took five grains three times a day for eleven months. Dr. C., notices also the fact, which is familiar now to the experience of many of the Faculty, who have used this treatment, that the lead is eliminated sometimes so rapidly that the symptoms of lead poisoning are wonderfully exaggerated under the use of the iodide. The salivation, which occasionally results after the remedy has been employed for awhile, is never present, unless mercury has been previously taken and become fixed as it were in the tissues. Hence is seen also the propriety of following up a long course of mercurial treatment, with the iodide of potassium as a means of removing any ill effects of the mercury.

V.

Prof. Doremus of New York, has been doing good service to the cause of public hygeine by his paper on the "poisonous effects of soda water from copper fountains and lead pipes."* His attention was attracted to the subject by the sudden illness of several persons immediately after drinking a single glass of mineral water. In some soda water examined, on boiling off the excess of carbonic acid, a green scum of carbonate of copper arose to the surface, which yielded as much as one grain and a half of metallic copper. The condensers are generally made of copper, which are said to be lined with tin. This coating however, even if well put on, is liable to be removed in part by chemical and mechanical action. Then the carbonic acid slowly causes the formation of a carbonate, which is soluble in carbonic acid water. The longer the water remains in the condenser, the more copper will it contain under these circumstances.

The condensers examined by Prof. D., however, were often found to be lined with tin mixed with soft solder, and the lead in the latter of course was readily destroyed—leaving the interior of the vessel more or less denuded of its lining and exposed to the action of the water.

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* American Medical Monthly, II—25 and 137.

It had been known for years, that injurious effects have occasionally resulted from the use of soda water, and this had always been attributed to the lead pipes through which the water was forced before it reached the fountains. Honest vendors of the article, aware of this, employed tin pipe for the conveyance of the water. But these experiments of Doremus, show that still more caution is to be employed in order to prevent an agreeable beverage becoming an insidious poison.

As to the effects of the copper not being more generally experienced as dangerous, Doremus remarks, that the cases are not few in New York where immediately after drinking soda waters, parties were seized with vomiting, epigastric pain, &c.; and that "it is probable the syrups which are the usual accompaniments of the soda draught act in many cases as antidotes." He suggests, that this poisoned soda water may be an exciting cause of cholera in those predisposed to it, and during its prevalence.

The mode of preventing all danger is to have the condensers well tinned, and the connecting pipe composed of pure tin, or what is still better to have the condensers made of stone ware, as in Boston, "covered externally with copper and circlets of iron to secure strength."

The season is now here when great quantities of this beverage are employed, and we should be prepared not only to understand apparent anomalous cases of poisoning that may arise in this way, but, as conservators of the public health, to warn against the use of mineral waters unless obtained from those who are known to be careful in their preparation. It is true according to the experiments of Wackenroder,* that the blood may contain very small quantities of copper without injury, yet where it is admitted so freely into the system as in the way just spoken of, pernicious consequences must result.

A case of poisoning by the eating of a root, is recorded in the papers of the day as having taken place in Baltimore county in the month of April. Judging by the symptoms, it is presumed the root was that of the *aconitum uncinatum*. There was severe epigastric pain, vomiting, general coolness of surface, spasmodic movements of the limbs; the whole series closing with death before medical aid could be made available. Two cases are reported in English journals of death* through the tincture of the same vegetable, being administered in large dose. One case of poisoning by the same substance which however yielded to treatment, came under the knowledge of the Chairman of the Committee, during last summer. The patient took too large a dose of the officinal tincture—and was seized with the special symptoms of poisoning by aconite—burning in the throat and stomach, foaming at the mouth, an obscuration of vision, epigastric pain, spasmodic movements of the limbs, vomiting, &c. The case was successfully treated with alcoholic stimuli, and aqua ammonia; it is believed that this treatment preceded by active emesis, in the early stages of such cases will generally be effectual.

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* Chemical Gazette, XII, 176.

An interesting case of the detection of cyanhydric or prussian acid is published in the *Comptes Rendus* of Nov. 13, 1854.† The The stomach was examined three weeks after death. "On the addition of pure neutral nitrate of silver, a yellowish floculent precipitate was formed in abundance, which, when well washed, dried *in vacuo*, and afterwards heated for a few moments on the sand bath, acquired a grayish color." This was soluble in ammonia and cyanide of potassium; prussian blue and prussic acid were readily formed from the cyanide of potassium into which it was converted by means of the decomposing power of potassium. There did not seem to be any chemical combination with the organic matter, and a quantity equal to 0.120 gr. of anhydrous acid was obtained.

The Herapath's of England‡ have lately communicated some views on the changes which this most active poison may undergo during the putrefaction of the animal body, and which changes have heretofore been overlooked in chemical examinations. These gentlemen found that there were clear indications of the presence of sulphcyanhydric acid in the blood, when prussic acid had previously been taken, although all tests failed to detect the latter substance. This acid (as also the sulph cyanides,) they hold, has not yet been detected in normal blood by the most careful analyses, and indeed it is admitted by Heintz and Lehman, that it only exists in the saliva. Now if it does not appear as a normal constituent of the blood, it is easy to perceive how it may have been produced by the action of nascent sulphydric acid gas, on prussic acid which had entered the system from without. Thus the spontaneous decomposition of albumen might prepare the way for the disappearance of the prussic acid, with the formation of the sulphcyanhydric acid. It remains however, before we trust to this experiment, to have instituted the most thorough and complete analyses of the blood with reference to the presence or absence of this substance in its normal condition. If it be not a normal constituent, prussic acid can be recognised with as little difficulty as a metallic agent. It would only be necessary to evaporate to dryness at a low heat, the organic substance to be examined; then to boil it with some strong alcohol, being mixed with some pure and recently ignited ivory black. The alcoholic solution should be filtered, evaporated to dryness, and dissolved in a few drops of water. If a sulphcyanide be present, on acidulating the solution with chlorhydric acid and adding a few drops of a transparent solution of a persalt of iron, a blood red color will present itself—not likely to be confounded with that produced by the presence of any other substance.

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*Medical Monthly, I, 223.

† Chemical Gazette, XIII, 51.

‡ Chemist, 1, 321.

The molybdate of ammonia has been recommended as a capital test for the detection of an arsenical from an antimonial tache, as produced in the process of Marsh. This salt has the property of forming a yellow colored compound with phosphoric or arsenic acids,* even though the latter should be present but in small quantities. The tache must be dissolved in boiling nitric acid, and the addition of the molybdate will produce a precipitate of a yellow color, if arsenic be present.

Dr. Tschudi has published descriptions† of toxicophagi, or poison-eaters, who live in the lower part of Austria and Styria, and who are habituated to the use of arsenic They consume it for a double purpose;—"to give themselves a fresh and healthy appearance and a certain degree of *embonpoint*." This is done by the peasant girls and young men by way of increasing their personal attractions; and "to attain more freedom in respiration so as to be able to ascend high mountains with ease." For the latter purpose they put a small piece of arsenic in their mouths whenever they have a long excursion to take up a mountain. This seems to give them the ability of ascending high mountains with an ease not otherwise accomplished.

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*Will's Outlines of Chemical Analyses, 121.

†Chemist, I, 762.

They commence with a piece about a half grain in size. After some time has elapsed, during which they use this quantity twice a day—the quantity is somewhat increased. A case is mentioned of one who followed the habit for forty years—taking as much as four grains a day—and had transmitted the habit to his son. Whenever the habit is dropped, emaciation follows. It increases the sexual feeling. The Vienna coachmen mix a little of it with the food of their horses—with the view of giving them "a bright aspect of the skin, roundness and elegance of form, and foam at the mouth."

This communication of Tschudi settles the point, which has been mooted for years, whether any one could keep up the habit of arsenic-eating for a long time without being a victim to the supposed cumulative effects of the poison.

In the detection of blood spots in medico-legal examinations, the chairman of the committee has found that the suggestions of M. Morin of the School of Rouen,* were very valuable and reliable, in cases where it is necessary to examine such spots on clothing that has been washed with boiling water and soap. The stained part has a greater consistence than the tissue itself, and the stain cannot after the treatment just mentioned, be removed by water either hot or cold.

The course to be followed, is first to immerse the stain in a solution of pure caustic potassa. This solution will dissolve out the stain and the addition of nitric or chlorhydric acid produces a white precipitate, which indicates the presence of a proteine compound. Secondly—the stained tissue is to be placed in contact with pure chlorhydric acid, which dissolves the entire matter of the stain, forming a solution that, when concentrated, will give us a blue precipitate with the ferrocyanide of potassium, and a blood red with the sulphcyanide of potassium.

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* Journal de Chimie Medicale.

Alfred Taylor recommends glycerine as the best fluid for removing blood stains, which have not been exposed to the action of hot water, since it does not dry, and therefore the microscope can be used at one's leisure in the examination of the corpuscles. Whatever evidence a chemical examination of blood may furnish, it is to a certain extent presumptive, since there are no positive chemical tests which will reveal its presence. We can only show the presence of the different constituents of this fluid, and then the conclusion will be so strongly presumptive that it will closely approximate to—yes even equal, positive demonstration. With the microscope conjoined, there can be no doubt about the matter; and *it* should *always* be employed in conjunction with the chemical experiments on the suspected spots.

In closing the report, the committee feel that the contributions of Chemistry during the past year have neither been small nor unimportant to that profession, we have all selected as the business of our lives to study and investigate. Often its cultivators are too rash and careless in their deductions from the various facts which have collected in the course of experiment. These must not be taken as arguments against the data on which they were founded, but as incentives to a more thorough study of the importance and proper relation of these data. Chemistry is a science, so to speak, of yesterday, and yet, like a young David, it has accomplished the overthrowal of the Goliah of superstition and ignorance. It must be employed as the servant of the physician—not with the view of utterly rejecting all other means of acquainting himself with the animal body, in health and in disease—but to substantiate and confirm what is indicated by those other means. Under such circumstances, it wlll be found one of the most useful of all the collateral sciences, in elucidating the secrets of the profession and the saying of Libavius—a student of Paracelsus—may be understood, "Medicus ille nequit esse magnus, cui chymia non est magna."

HENRY CAVENDISH

AND

THE DISCOVERY

OF THE

CHEMICAL CONSTITUTION OF WATER.

A LECTURE,

INTRODUCTORY TO THE

COURSE ON CHEMISTRY,

IN THE

NATIONAL MEDICAL COLLEGE,

SESSION OF 1855-6.

BY PROF. LEWIS H. STEINER, M.D., &c.

(FROM THE AMERICAN MEDICAL MONTHLY.)

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To the student of any particular branch of human knowledge, one of the most interesting subjects is the history of the discovery of its principles, and the various incidents in the lives of those men who have given an impetus to its study. *Here* he can see how many difficulties had been encountered before the very basis of knowledge was attained; how many days and nights of toil were consumed in quarrying from the rough mountain the huge blocks, and in subjecting these to the ponderous blows of heavy hammers, as well as the fine strokes of delicate chisels, so that they could be used in laying the foundations and shaping the corner-stone of the superstructure, which now strikes the eye with its symmetrical form and passing beauty. He will find that each step in the progress of a science has been marked with labor of the most intense kind; that, although the results are striking and seemingly self-evident, they are no more so than the erection of some grand architectural structure, some noble old cathedral pile, where the architect's idea has been so well carried out in every part, that the spectator is forgetful of the enormous cost, the great expenditure of money, and time, and human labor, required to develope and represent this idea. Every course of stone has been laid with care, and much fatigue has been undergone in placing it so that it shall be able to withstand the weight of those destined to be placed above it. And all depends on the foundation being securely laid, deep below the destructive influences of the frost, and on the solid clay or still more solid rock, so that no ordinary tempest or earthquake shall unsettle those walls which embody the idea that had existed in so much beauty in the architect's mind.

No study can be more instructive than an examination of the difficulties the great men of the past have experienced in their toilsome investigations. We not only learn to appreciate the importance of the latter, but we acquire a knowledge of the causes which impeded their progress, and which we should avoid in conducting similar original investigations for ourselves. Thus profit is not only directly derived in the way of knowledge gained, but indirectly also, since we learn to avoid the shoals and quicksands on which the strong barks of others have nearly been made perfect wrecks.

The history of Chemistry is full of most interesting facts connected with its great discoverers, and it is well for its students to rest awhile from their labors and to peruse these with care, so that they can estimate properly how great is the light under which they now prosecute their studies, and to whom they are indebted for it. It has been thought that some things connected with the history of Cavendish and his discovery of the chemical constitution of water might not be unprofitable or uninteresting.

Henry Cavendish was one of those few men, coming from the wealthy ranks of society, who have not only been Mæcenases to science, but who have expended their time and talents, as well as their money, in its cultivation and advancement. His name and his fortune, his intellect and his life, were freely expended in the cause of science, so that when the great French mathematician, Biot, summed up his character, he felt that he could truly say, that Cavendish was "*le plus riche de tous les savans et probablement aussi, le plus savant de tous les riches.*"

He was the son of Lord Charles Cavendish, the third son of the second Duke of Devonshire. The family can be traced as far back as 1366, in the reign of Edward III., and it seems to be singularly marked, according to Dr. Wilson,* "for the high moral character which for so many centuries it has maintained."

He was born at Nice, October 10, 1731; entered the University of Cambridge December 18, 1749; and left the same, without graduating, in 1753. Of his early life we know comparatively nothing, partly on account of the neglect of contemporaries to record such incidents, and partly on account of the peculiar retiring habits of the man himself, which prevented him from speaking of his early life or indeed of unfolding his inmost character even to those who knew him best. He became a member of the Royal Society in 1760, and from that time up to the period of his death, in 1810, presented many most valuable papers to this Society. We find him spoken of † as "an excellent mathematician, electrician, astronomer, meteorologist, and geologist, and a chemist equally learned and original. In the fullest sense of the term, a natural philosopher; and had he published during his lifetime all the researches which he completed, his reputation would have been much wider and more varied even than it was." But a natural repugnance to appearing before the public prevented him from doing that thing men are so prone to do—to announce the novelties they have discovered, or even to magnify their importance.

As a man we find nothing in his character to love—a stern, impassive representative of a cultivator of science and nothing else. His biographer describes him ‡ as one "who did not love; he did not hate; he did not hope; he did not fear; he did not worship as others do. There was nothing earnest, enthusiastic, heroic, or chivalrous in his nature, and as little was there anything mean, grovelling, or ignoble. * * * * An intellectual head thinking, a pair of wonderfully acute eyes observing, and a pair of very skilful hands experimenting or recording, are all that I realize in reading his memorials. His brain seems to have been but a calculating engine; his eyes inlets of vision, not fountains of tears; his hands instruments of manipulation which never trembled with emotion, or were clasped together in adoration, thanksgiving, or despair; his heart only an anatomical organ, necessary for the circulation of the blood."

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* Life of Cavendish, p. 14.

† Life of Cavendish, p. 19.

‡ Life of Cavendish, p. 185.

It may be fairly asked, why bring such a character forward for examination? Surely it is not desirable that it should be imitated? Are we not created for grander and nobler purposes than to be mere negations in a world where one's social influence is of such immense importance? Is it enough *not* to be a villain, a debauchee, a murderer? Or, rather, is it not our duty to be *something* that shall create an influence for *positive good* on our fellow-men? To this the answer must be made, that the character of Cavendish is not introduced as a subject of admiration, or for imitation, but rather as a warning to all men who cultivate the intellect, that they do not neglect the social portion of their nature. While they are rising higher and higher into those regions where an almost intuitive power is given them of perceiving the secrets of nature, it is necessary to strengthen the links of that chain which binds man to man, and which become brighter and brighter with each deed of love and philanthropic kindness. The character of Cavendish thus may serve as a warning set up in the highway of science, to let men beware of immolating all that is common with their fellow-men on its altar, although the investigations they may prosecute shall eventuate in much general good. Their duties are more extensive. *as men*, and while students of science they must not forget these, else we shall class them as Cavendish was classed, as "a cold, clear intelligence, raying down pure white light, which brightened everything on which it fell, but warmed nothing," just as the cold moon may light the traveller's path across the trackless snows, but not contribute one genial ray of heat which shall envigorate his strength, contribute to his comfort, or help him to withstand the icy blasts that are so furiously beating against him.

A word as to the subjects which claimed attention from Cavendish's clear mind, and the general nature of his contributions towards their full elucidation, and we shall proceed to the special discovery we wish to examine at this time.

The determination of the specific gravity of the earth occupied his attention for a long time. His determination (A. D. 1798) was 5.4; and although many experimenters have repeated *his* experiments and made others with reference to the same subject, this number has not been materially altered, the decimal only having been found incorrect, and the specific gravity now being considered 5.6. He determined the freezing point of mercury as between 39° and 40° Farenheit, by a series of experiments which were performed, (A. D. 1782,) in accordance with his directions, by Governor Hutchins, at Albany Fort, Hudson's Bay. Prior to this, it had been considered by Braun at between 300° and 400° Fahrenheit; and the most singularly discrepant views were entertained as to the exact point. The consideration of many subjects connected with heat is so closely bound up with a proper knowledge of *this* point, that its importance will be at once recognized.

Next we find him making some experiments relative to the exact composition of the air; and although the two main constituents of the air were already known, yet it was left for Cavendish to show, that in any given quantity of air, the maximum of consumption of its oxygen by a burning body was one-fifth, and that the per centage of this gas in common atmospheric air was 20.833. The approximation of this determination to that attained at the present time, by the aid of the delicate balances which our scientific mechanics have furnished us, is most wonderful, and can be only understood when we recollect that it was the result of many hundred analyses of the air made during sixty successive days in the year 1781, by this indefatigable experimenter.

In Pneumatic Chemistry, or the chemistry of the gases, although he is considered the fourth in order of time among the English chemists—the other three being Hales, Black, and Priestly—yet he is entitled, on the score of discovery, to a rank along with the first. Dr. Wilson very truly says, " We have done little more in later times than extend, improve, and, as we complacently say, *perfect* Cavendish's processes for the analysis of gases, and that we differ from him more in our mode of interpreting certain of the phenomena he witnessed than we do in our methods of investigating elastic fluids." His thorough knowledge of a proper *modus operandi* with the gases made him adopt the securest methods of experimenting, so as to allow of the least possible chance of a failure. Accordingly we find that, despite of the imperfection of apparatus (which was exceedingly imperfect and complicated), despite of the general ignorance of both physical and chemical properties of the gases, despite of the thousand and one difficulties that at all times beset the discoverer's path, the experiments of Cavendish were accomplished with an accuracy that our better knowledge of the subject, and command of more perfect apparatus, scarcely make us capable of excelling. In the school of these experiments, his attention was directed to the rationale for the formation of globules of water whenever the electric spark was passed through a mixture of hydrogen gas and atmospheric air, the result of which was the announcement of the greatest discovery of modern times, that of the exact composition of water—and one on which, in our opinion, the present character of chemical science rests as its true basis—without which the whole of analytical chemistry would be at best but a series of shrewd guessings at the composition of material substances, and synthetic chemistry would be confined to the *accidental* formation of substances, instead of that series of sure results with which we find it now abounding.

I call the announcement of the discovery of the composition of water the initial point in the history of rational chemistry, whether we view it in the departments of analysis or synthesis, in medical chemistry, or chemistry applied to the arts. Prof. Playfair has not gone too far when he stated in his lecture before the Society of Arts, Manufactures, and Commerce, that "the discovery of the composition of water has given to Industry a vitality and an intelligence, the effects of which it would be difficult to exaggerate."

Let us briefly examine the history of this discovery, and then see in what way it has been of so much importance to mankind. In doing this it is not desirable that we should involve ourselves in the polemic arguments that have been brought forward by the friends of two other great men, who are said to have made the discovery prior to its announcement by Cavendish. Much ill-feeling has been excited by the friends of Watt and Lavoisier on this subject, and no less a person than M. Arago has taken the position that Watt really was the discoverer, and that Cavendish had filched all his knowledge of the composition of water from a letter which Priestly had received from Watt. Without going into an examination of this serious charge, which would involve a tedious enumeration of many circumstances to us of no interest, and which would only lead us to the conclusion arrived at by all impartial English observers, that Cavendish was the prior discoverer, we need only say that the charge of plagiarism is entirely dissonant from the general character of this great man, who seemed under all circumstances equally careless of praise or blame from the world.

Priestly and Warltire found, whenever hydrogen gas and atmospheric air were exploded by the electric spark, that there was a deposition of moisture on the inside of the vessels containing the gaseous mixture. Prior to this, however, Macquer, in 1766, observed that whenever a glass vessel was held over a burning jet of inflammable gas, that moisture was formed inside of the vessel. Warltire explained this by the supposition that the gases contained some water diffused through them, and that this, being condensed, appeared in drops on the sides of the containing vessel. Cavendish found that there was no diminution or increase of weight in the vessel after the explosion, but that a volume of hydrogen twice as large as the oxygen in the air had disappeared, that it had left its gaseous condition, and was converted into water. He performed the experiment on a still larger scale, so that this fluid might be examined, and arrived at the conclusion " that this dew is plain water." The after-course of his experiments was directed to the determination of the quantities of hydrogen and oxygen necessary to form water. He discovered that if one volume of oxygen and two of hydrogen were exploded in any way, the result was the conversion of the whole of the mixed gases into water.

Now, how does this discovery, so disconnected at first sight from the other facts of chemistry, affect the whole progress of the science? How does the simple fact of the knowledge of the true composition of water bear so important a part in the progress of chemistry as to be considered by any one as the initial point in the history of this branch of study as a science? Might we not have a knowledge of all the other elements, and yet remain under the belief that Aristotle and thousands of his followers held, that water was an elementary substance? Could we not have unfolded the arcana of nature without first having cleared up this point, and considered the bland agent which nature uses in effecting the wonderful works of change as an elementary substance?

To all of these interrogatories, the more we think over the subject, the more impressive and emphatic must be our negative. Nothing could have been done which would not have been involved in all the mystery and obscurity that marked every result of the chemist's labors prior to the year 1781. And this is perfectly apparent, when we reflect over the paltry theory of Stahl, as to combustion, which was at that time leading all the world into a maze of confusion with its queer reasons for the combustion of a body, because it had *a something* called phlogiston in it, which regulated the duration of the combustion by the amount present, and when all of this substance escaped, *then* the body ceased to burn. It was necessary to have some plausible, and not only plausible, but some correct theory of combustion, as well as some account of the composition of water. These were both furnished by Cavendish's experiments.

In order to understand *quantitatively* the composition of bodies, it is necessary to get the combining number of some one elementary substance,—to have that well ascertained, and then we are ready, by the known laws of chemistry, to ascertain the combining numbers of all bodies, with which this particular substance forms combinations. In other words, the *equivalents* or *atomic weights* of all the elements could never be obtained had we not that of one single element to commence with. But it would be impossible to obtain the combining number of an element, without experimenting with it when in a state of combination, and hence it is necessary in order to obtain these numbers, in which all certainty in quantitive chemistry is founded, that we should have a certain knowledge of the weights with which two elements combine in the formation of some known compound. This could be done in the case of water, after the compound nature was once fully understood. A Dalton could weigh the constituent elements and find that the oxygen always weighed eight times as much as the hydrogen, although the latter was twice as much in bulk. After experiments proved that these numbers, 8 and 1, indicated the only proportions in which these two elements would unite with any other elementary substance, and that each one of the others had also a number peculiar to itself, indicative of its combining proportion. And so, *on this discovery*, we may say, was reared that essential guide to all our chemical labors, the atomic theory.

It was a grand discovery, to find that all the substances in nature were allowed only to combine with each other in fixed and definite proportions, and that thus, instead of an infinitude of compound bodies, produced by an heterogeneous union of the elements, the number was to a certain extent fixed and immutable. The proportions with which they combine together is capable of being expressed in numbers. The chemical constitution of all matter becomes, when viewed in this light, beautifully illustrative of the poetry of science. No longer need we leave our own planet to behold this poetry of science, and, with the astronomer, roam through the wide circuit of the universe, as it, with silent grandeur, acts its epic in the measured numbers which his science reveals with so much accuracy. For though our knowledge of the mighty orbits of planets, and the perturbations which these occasion on each other's movements, impress us strongly with the harmony which pervades all creation and enable us to understand what the ancient philosopher spoke of as the Music of the Spheres; yet is not this harmony confined only to the movements of these great bodies, but permeates every particle of their structure, and beautifully governs the composition of all matter.

The slightest change in the composition of a body is sufficient to alter its nature as an innocuous substance, so that it shall become a deadly poison. Add but one atom of hydrogen to the atom of water, cause a chemical combination to take place between the two, and instead of a supporter of life, and a substance necessary to the life-giving circulation of plants and animals, we find a poisonous substance of so caustic a nature, that when brought into contact with the tongue it produces at once a powerful burning sensation. Fortunately for all living beings this combination is not readily effected, nor is the compound a very persistent one. Otherwise we should be in danger of being poisoned by the very substance which is now the blandest in nature. How well does this fit us to understand the beautiful remarks of Farraday, as to the effects of a knowledge of these facts on the contemplative philosopher? "When I consider," says this distinguished savan, "the multitude of associated forces which are diffused through nature—when I think of that calm and tranquil balancing of their energies which enables elements, most powerful in themselves, most destructive to the world's creatures and economy, to dwell associated together and be made subservient to the wants of creation—I rise from the contemplation more than ever impressed with the wisdom, the beneficence, and grandeur, beyond our language to express, of the Great Disposer of all."*

What an argument against the existence of blind chance is this exact proportion in which elements will alone unite with each other! How consummate a wisdom is thus shown in the formation of the smallest atom of water, which, wherever found, exhibits the same composition. The comtemplative chemist finds himself overcome when he sees the wonderful wisdom, that not only knows the fall of the sparrows to the ground, but has assigned eternal laws to the structure of every atom of that ground itself.

I have assumed here that the full knowledge of the composition of water led to the discovery and announcement of the atomic theory. It was not the special substance under examination by Dalton when the theory suggested itself to his mind; for that was the composition of the compounds of nitrogen and oxygen. But these could not have been understood unless Cavendish had prepared the way for it by first explaining the composition of water. It is proper that this explanation should be made lest a charge of innaccuracy be brought with reference to our statements. The atomic theory was the indirect result of this great discovery of Cavendish.

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* Farraday's Lectures, p. 191.

But we have said the discovery of the composition of water was an initial point in the history of rational chemistry. What has been done by this science in the last seventy years? The answer to this question will show the importance of the discovery. In framing such an answer, the difficulty is to know where to commence, since chemistry has intertwined itself so much with the progress of every science, that its benefits are hardly to be appreciated by us unless we closely examine the history of the past, and after having obtained a full knowledge of the comparative ignorance of those days, then look around us and see the blessings which science has showered on us in the present.

Every art has been supplied with a knowledge of all the substances that enter into the composition of the materials it employs, or the tools necessary for their proper working. The perfection of processes, which were formerly dependent entirely on the chance combination of proper quantities of the materials employed, is now so great that empiricism has ceased its rule in the mechanic arts, and the chemist's discoveries constitute the bases on which these are constructed with their huge proportions and wonderful adaptation to the wants of man.

The materia medica is being gradually explained, and its potent extracts, obtained through the aid of pharmaceutic chemistry, are now employed by the scientific physician to the alleviation or cure of disease. He finds himself no longer confined to a mere empirical exhibition of enormous qunatities of drugs, but more elegantly and efficaciously uses their proximate principles, while he rejects their inert constituents. But more than this yet, many of the recondite processes of the living body have been determined to be purely chemical, although regulated by the vital force, and hence he learns to produce such modifications in them as are required when disease has forced them to assume an abnormal form. Much thus of philosophic, rational medicine owes its origin to these improvements of chemistry. The physician of the present day who neglects its teachings, gropes along his path with a blindness that is as pitiable as it is unjustifiable. He blindfolds his eyes to keep out the glorious sun-light of science, which is shedding a dazzling radiance over the pathway of his brethren ; he wanders along alleys and bye-ways, when the straight and broad highway could bring him at once to a terminus of all his labors ; he prefers darkness to light, and by some peculiar mental obliquity is prevented from adopting the direct path, but works along in the circuitous meanderings of that curse to all success—*Routine!* He has joined himself to the ignorance of the past, and rejected the knowledge of the present, and an inward turning of all thoughts on the past, has made him " the man behind the age"—a species of skeleton in the social circle of his profession, from whose bones and worm-eaten ligaments his brethren can demonstrate to their students what was the structure of medicine before the spirit of science entered it, and made dry bones to move, clothed them with muscle and cellular tissues and skin, caused artery, vein, and nerve to ramify around them, and infused the breath of active, thoughtful life.

Analytical Chemistry has revealed to us the quantities of the various elements which enter into the formation of the inorganic kingdom, and also of many portions of the organic kingdom, and has enabled the chemist, by synthesis, to form inorganic compounds, far exceeding in number and variety those found in nature, and of varied uses to mankind. Indeed, it has enabled him to use the various agencies of nature in so many novel ways, that new branches of art have sprung up all over the world, which have given thousands of artisans constant and profitable employment. Chemistry has become a science of most certain vitality, and gifted with the power of imparting its vitality to every branch of human industry with which it has anything at all to do. The artisan must feel its importance, and he desires his children, male and female, to have a knowledge of its principles, so that they can avail themselves of the discoveries of the day as they appear, and have an intelligent appreciation of their bearing on what has been done in the past, or may be expected to be done in the future. Hence it is one of the branches of study which occupies a prominent place in any well-digested system of education, bearing with it the interest which always is attached to the study of anything that directly concerns man as man, and which is capable of illustration in an experimental way. Popular lectures on the subject are devised to meet the want with those who had not the means of studying the subject in their school-days, and the crowds of ladies and gentlemen attending these lectures attest the general interest of the community in a subject so manifestly important as chemistry.

Surely all this, if it has had its origin in the impetus given to the study of chemistry by Cavendish's discovery, must surround the latter with so much importance that no excuse need be given for the introduction of the name and character of Henry Cavendish to the present audience.

But we have not done with Cavendish as a chemist. We must not forget that his right to the discovery of hydrogen gas, as a *distinct* element, is undisputed, even by his enemies, although they have endeavored to rob him of the priority of the discovery of the composition of water. This gas was known prior to his day, and Thomson considers its combustibility as known at the beginning of the eighteenth century.

Cavendish, in the commencement of his observations, labored under the disadvantages which clung to a student of the Phlogiston theory. He found that an inflammable gas was freely discharged whenever iron, zinc, or tin were brought into contact with dilute sulphuric or muriatic acids, and quaintly says: "Their phlogiston flies off without having its nature changed by the acid, and forms the inflammable air."* He imagined thus, at first, that the heating principle of bodies was this phlogiston, which was supposed to fly off during the phenomena of heat and light, and that when metals were plunged in either of these dilute acids, it escaped in the form of an æriform body, which he called inflammable air. Afterwards, however, he advanced the idea that inflammable air was a combination of the mysterious phlogiston and water. Its different properties were carefully examined—the circumstances under which it would burn, and how much atmospheric air must be present, in order to allow of perfect and entire combustion of the gas were carefully noted. Not being satisfied with this, he advanced to the discovery already noticed, and finding it a constant constituent of water, arrived at the conclusion that the gas given off, whenever the metals mentioned were brought into contact with dilute acids, was furnished from the water with which these acids were diluted. His views as to the real nature of the gas, divested of the foolish nomenclature of the Phlogiston School, show that he had a clear idea of its nature and properties.

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* Wilson's Life of Cavendish, p. 197.

During his examination of the gas, his attention was directed to its weight, and he made, according to his biographer, "the first *successful* attempt to compare the density of a gas with that of common air." The attempt had been made previously by Hawksbee and Greenwood, as well as Hales. Their attempts failed for various reasons. It was left, however, for the mind of Cavendish, which was essentially mathematical, to devise such processes and apparatus as would enable him to experiment without any fear of failure. Quantitative examinations were those alone which satisfied his mind, and to the test of weight and measure he endeavored to bring every subject which he examined, not being content until some satisfactory answer was obtained from this test. Hence he was the first who found out that the different gases have, for equal bulks, dissimilar weights. His estimate of the specific gravity of hydrogen was found entirely too large, as he made it about one-eleventh of atmospheric air, whereas the latter is about 14.4 times heavier than it. Such a near approximation, taken into consideration with the necessary imperfection of apparatus at that day, and the probable imperfect removal of atmospheric air from the vessel into which the hydrogen was admitted, must entitle our chemist to the greatest praise for his accuracy, instead of blame for a want of accuracy.

The next subject we find him examining with his usual care and patience was carbonic acid, or fixed air as it was then called. It would be difficult to say who was first acquainted with this acid gas. Paracelsus seems to have known some of its properties, though its name of fixed air was given by Dr. Black, who examined it prior to the date of Cavendish's experiments. Black seems, however, never to have published any account of its properties in general. In 1766, Cavendish took up the subject, and prepared the gas for examination by the action of chlorhydric acid on marble, a method still adopted by the venders of carbonic acid water as the most economical and convenient. His researches resulted in the acquisition of a full knowledge of all its properties, even gettihg the specific gravity very nearly correct.

We must recollect that experiments could not be carried on then as now, with the aid of numerous laboratory appliances, such as glassware of an infinite variety of forms, the multifarious uses of illuminating gas for heating purposes, and the convenient purposes to which caoutchouc is applicable. The modern chemist is supplied with a vast deal to assist him in his researches which the chemist of even fifty years since was not able to command. Consequently, even approximate accuracy in the latter merits much higher praise than perfect accuracy in the former. Continued demand for scientific apparatus has stimulated the mechanic to contrive various means for meeting the chemist's wants, and this he has succeeded in doing so well, that every day affords some fresh evidence of his skill, and the useful assistance he can render to the chemist.

While Cavendish was performing his experiments with reference to the composition of water, by passing an electric spark through a mixture of hydrogen and atmospheric air, he came across a singular result, which had been altogether unexpected. The water produced by the explosion was found possessed of acid properties. This was proven by its converting the blue color of litmus into a red, and by its combining with lime and forming a salt. It was nitric acid. Whence could it have been derived? He followed this query with great care to its ultimate bearings, and soon saw that the electric spark produced an union of the two gases, nitrogen and oxygen, in the proper proportions to form this acid. The fact has been proven in a number of ways since Cavendish's day. Farraday* "has shown that if a piece of paper dipped in a solution of caustic potash be stretched a little below and between two brass balls, from one of which electric sparks are passing to the other, the alkali will be rapidly converted into nitrate of potassa, and the paper become touch-paper."

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* Life of Cavendish, p. 261.

This discovery was probably one of the greatest contributions he made to the cause of science, and it proceeded as a necessary consequence from the experiments with reference to the constitution of water. We have here a clear explanation of the appearance of nitric acid, to a greater or less extent, in all rain water. The passage of the electric current in every thunder-storm repeats, on a large scale, this experiment of Cavendish, and produces a small quantity of nitric acid. This however, only takes place directly along the track of the lightning; and hence but a small quantity of this poisonous acid is formed in the atmosphere, is absorbed by the rains and descends to the soil. But the electric flash does not only, as Cavendish thought, cause the union of the nitrogen and oxygen so as to form nitric acid, but if hydrogen be present also, it causes an union of the nitrogen with it also, and the consequence is the formation of ammonia, which neutralizes a large quantity of the nitric acid, and descends in the rains to invigorate the exhausted soil as nitrate of ammonia. It is not always easy to account for the appearance of this substance in the soil, unless we had been prepared by these views of Cavendish, to account for its formation in the atmosphere, and after transference by the rains to the soil. Nitric acid does not form a constituent of any rock which is widely distributed over the surface of the globe, and yet the nitrates are found always in fertile soils, and in some tropical climes, where there are frequent storms, the quantity becomes so notable that thick incrustations are found on the surface. This acid in the nitrate seems to have considerable effect on the growth of plants, and to be indeed a most indispensable constituent of good soil. Its presence in the soil, as conveyed to it from the atmosphere, is beautifully explained by the aid of this discovery of Cavendish. Prof. Johnston* remarks, on the subject of the formation of nitric acid: "After a thunder-storm plants appear wonderfully refreshed; in thundery weather they grow most luxuriantly, and other things being equal, those seasons in which there is much thunder are observed to be most fruitful.

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* Johnston's Lectures on Agricultural Chemistry, p. 160.

Some have ascribed these results to the *immediate* agency of electricity on the growth of plants. Is it not equally possible that they may be connected with this necessary production of nitric acid." The Professor then goes on to state that this acid is difficult to detect in minute quantities; yet "how much must be formed in a thunder-storm, even in our climate (Great Britain), to make the presence of this acid *always* appreciable in the rain that falls—how vast a quantity in those warmer climates where such storms are so frequent and so appalling." Thus the agricultural profession has been supplied with a capital explanation of a most important subject, and the import of Cavendish's discovery is much more than he could have dreamed of. The importance of this discovery is still greater when we view it in its direct bearing on the question of the combustibility or not of nitrogen.

Cavendish's formation of nitric acid out of nitrogen, in the way just mentioned, proved conclusively that this gas could be oxidated under certain circumstances, or that it could be subject to combustion, using the latter term in its widest chemical signification. This has been seized hold of by Liebig and Johnston, and made also to subserve the purposes of agricultural chemistry, in the way of accounting for the immense quantity of nitric acid contained in some soils, far beyond that which could possibly be formed from the action of electricity on the atmosphere. Whenever organic matter containing nitrogen undergoes the processes of decay or putrefaction, ammonia is formed from the hydrogen of the water present, and this nitrogen. But this ammonia is rarely found present in very large quantities, although large quantities of nitric acid are readily recognized, and mostly in connection with alkaline bases, making nitrates. In fact, the presence of these alkaline bases determine the metamorphosis of the ammonia into nitric acid, through the combustion or oxidation of its nitrogen. The alkaline bases induce, so to speak, "this oxidation, by the tendency of these substances to combine with the acid which is formed by this union of the elements of which nitric acid consists."*

This explanation of Liebig, based on Cavendish's discovery, beautifully illustrates the immense importance any discovery in science may be to *present* and *after* investigations, and also how little able a discoverer is to realize the importance of the fact he has attained after long and toilsome research. Truth is indeed of such a nature that its value stops not at one point, but by inosculations many and various, extends its aid to all branches of knowledge, and binds them together by a common bond, so that what is useful to one branch will be seen alike important and useful to all, and *catholic* in all its peculiarities.

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* Johnston's Agricultural Chemistry, p. 163.

When we sum up the peculiarities of Cavendish as a chemist, we find them to be as follows: A mind perfectly free from all foregone conclusions, and hence specially suited to carry out new lines of investigation, and to interpret properly the meaning and bearing of the results therein attained. This is by no means one of the least important peculiarities of mind required by the experimenter. How many ridiculous estimates have been made of the results of experiments, merely because the glasses through which the experimenter viewed them, had been previously so colored that their true form and nature could not be clearly recognized? Thus monstrous theories have been warmly maintained because their authors have determined that such and such results should be produced by their experiments. The real nature of the results has been overlooked, and men have been led astray by their false interpretation, until some mind, unprejudiced by theories of its own, has examined them carefully, and has sifted them from all irrelevant matters, and arrived at the simple truth. The history of chemistry, past and present, is teeming with illustrations of this kind, and many really important discoveries have been overlooked while some apparent confirmation of an unsubstantial theory has been seized as pure gold by the blinded experimenter. Indeed, it is one of the most difficult of all things, to elaborate a course of experiments, with a mind perfectly freed from all disposition to give a certain complexion to the result, and to truly interpret only so much as is really presented by it. Too often the result is but used as a mirror, in which the chemist only sees his own darling idea reflected, without paying any attention to the real nature of that mirror, or to the obliquity of his vision, which is but viewing a projection forth of his own ideas in all their unsubstantiality, rather than the truth involved in the material form before it. Such was not the habit of Cavendish. Mistakes were frequently made as to the results of experiments, never on account of any peculiar theory to which he was determined, to bind them as illustrations, but on account of the slight knowledge which the world possessed of chemistry, and therefore its inability to recognize, at first sight, the full meaning of its facts. But repetition of his experiments enabled him to see errors, and to place himself right as to his conclusions. On this account he never published a paper on any subject until he examined his own views with the sternest critic's eye, and forced them to undergo the severest tests. There was no disposition to enter a *caveat* against any one's poaching on his grounds—no use of the meetings of scientific societies or the pages of scientific journals for the publication of ill-digested opinions on novel results of experiments. But all his published manuscripts show that they have been carefully digested—his opinions freed from all irrelevant matter, and tried and approved by, or rather based on experiment. The author of "Pursuit of Knowledge under Difficulties," says that "he never advanced anything in any of his papers which he had afterwards to retract."

It is evident also that, in addition to a mind free from any bias in the examination of his experiments, he was a careful manipulator. His apparatus was of the simplest character. He took no delight in complications of apparatus, which only impress the eye with their complexity and weary the operator. His mechanical skill as a deviser of new forms of apparatus was exceedingly small, but he had the still happier facility of adapting the old forms to his own purposes and making them available. Hence all the apparatus which has descended to our time from the laboratory of Cavendish is marked with great simplicity and even want of finish.

Another peculiarity of Cavendish as a chemist, and which has already been incidentally alluded to, was his fondness for quantitative determinations of all substances which he examined, and the accuracy of those determinations. This must have been the result of a mathematical turn of mind, which he derived from his father, Lord Charles Cavendish, who was an excellent mathematician, "who had devoted himself to meteorology, and had paid special attention to the improvement of the thermometer and barometer, so that our philosopher was easily trained to the points essential to the accurate construction and employment of these instruments." This mathematical turn of mind caused him to combine the study of physics with that of chemistry, and the subject of electricity and the aurora borealis were well treated of by him. But its greatest influence was in the determination of accurate quantities in his examinations. The quantitative analysis of the air compares well with those since made with the best laboratory appliances. The specific gravity of carbonic acid gas, as determined by him, has already been shown to be approximately correct, and this is true of every quantitative determination.

If mathematical accuracy, great care and simplicity, and an unprejudiced mind, are essentials in the composition of the chemist, surely we have them here, combined in a most wonderful manner in the case of Cavendish. We are now led to see how these, with his remarkably original turn of mind and powerful intellect, enabled him to tower above his scientific compeers—to write his name high up among the benefactors of mankind, and to have a reputation as a scientific man which it must ever be the jealous care of his brethren to maintain with its original brilliance.

A few words on his character as a man and the cause of his peculiarities, and our task is done.

One of the most remarkable traits in the character of Cavendish was his extreme diffidence and indifference to society of all kinds. He was scarcely ever found in society, and never willingly entered into conversation with the opposite sex. This was carried to so great an extent that he never communicated orders to his female servants directly, but by means of a note directed to his housekeeper. An anecdote quoted by his biographer, Dr. Wilson, from Tomlinson, illustrates this perfect misogyny in the most amusing way. "One evening," says Tomlinson, "we observed a pretty girl looking out from an upper window on the opposite side of the street, watching the philosophers (the members of the Royal Society Club) at dinner. She attracted notice, and one by one we got up and mustered round the window to admire the fair one. Cavendish, who thought we were looking at the moon, bustled up to us in his odd way, and when he saw the real object of our study, turned away with intense disgust, and grunted out 'Pshaw!'" Dr. Wilson suggests as the origin of all this want of sympathy, that he lost his mother in early life, and that he was brought up away from the genial and humanizing influences of home. The explanation is exceedingly probable, for we cannot conceive how any one who has learned to appreciate the kind care of a mother, to prize those genial effects her sweetness of character and gentle disposition have produced in his own, to adore the purity of thought and feeling that so sweetly marks her life, without feeling the highest respect for the sex, whose gentleness is so much more powerful than our strength, that the stout man is often caused to bend the knee before it, and feel his own real moral weakness from the contrast. The man that has loved a mother can never have a low appreciation of the sex, if it were only for her sake.

But with all Cavendish's retiring habits he was exceedingly liberal, not knowing exactly how much he *should* give when solicited for a benevolent object, but always giving as much as any name on the subscription list. An anecdote of his liberality is given by Cuvier. A young man had broken a very valuable piece of apparatus, and the keeper of his apparatus came to tell him of it—the only answer he received was, "it is necessary for young men to break instruments, in order that they may learn how to use them—have another one made."

Routine marked his daily habits, which were the same for the greater portion of his life. The same style of clothing, the same place for his household affairs, even the same bill of fare for his dinner—truly has he been styled "a piece of intellectual clock-work"—that was not intended to produce any effect on mankind in any other department than that of pure knowledge. He has gone to his grave—one of the most distinguished of the benefactors of science—unwept, although honored.

It was thought that an examination of this great man's character, and his most important discovery would be useful, at the opening of our course on chemistry, since his name must be occasionally mentioned, and the sources from which information with reference to his life is to be gained, are but few. Large draughts of material have been made from the very fair and impartial account of his life by Dr. George Wilson, which is accessible to but few in this country.

It is pleasant to treasure up the little incidents connected with the history of great discoveries, and the lives of their authors. If the latter, in a social respect, does not inspire us with as much love and regard, as would a close examination of the life of one more peculiarly belonging to this country, that of Sir Humphrey Davy ; yet, we can profit by it, if we only learn to avoid the blemishes in our own character, which were so prominent in that of Cavendish.

Gentlemen, our science is connected with so many departments of research, that it demands the attention of every man, but most especially that of those who propose to themselves to adopt the profession of medicine as their calling, or rather those who feel themselves *specially called* to its study, for none others should enter the ranks of medicine. If the example of Cavendish stimulate you to the cultivation of chemistry with methodical accuracy and care, your results, if not so striking and imposing as his, yet I am bold to say, will be important in fitting you for your noble calling. The moral heroism of our profession, as exhibited from time immemorial, during the visitation of destructive scourges, and most especially within the season just past, is sufficiently great to demand the admiration of a gazing world. May you all be ready to exhibit the same unflinching attention to duty, having previously prepared yourself by honest and laborious study to accomplish such duty ! May the results of all your *studies and labors*, in the various branches of the professional preparation, fit you to become, not only great men, but what is much better, good men, useful physicians, each a hero in his sphere.

REPORT

ON

STRYCHNIA:

ITS PHYSIOLOGICAL PROPERTIES, AND CHEMICAL DETECTION.

BY

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EXTRACTED FROM THE
TRANSACTIONS OF THE AMERICAN MEDICAL ASSOCIATION.

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REPORT.

The alkaloid Strychnia was discovered in the year 1818, by Pelletier and Caventou, of France. From that time down to the present it has attracted much attention, from the medical profession, on account of its peculiar action on the animal system, its employment as a remedial agent in certain forms of disease, and its occasional use as an efficient and certain poison by suicides. Much has been written on the subject, but not collected so as to form a connected account of its properties. Indeed our knowledge of the properties of Strychnia is, as yet, comparatively small, and it is only proposed to collect, in this paper, what may be relied upon as accurate and true so far as the physiological properties and chemical detection of this powerful alkaloid are at present known.

However admitted into the system, it acts by entering the circulation, and in this way is carried directly to the nervous centres, whence its peculiar effects are transmitted then to the muscular system. When injected in the veins it acts most promptly and energetically. This was fully established by Vernière, in the year 1827, as quoted by Pereira,[1] in an experiment showing that the blood acquired poisonous properties from its presence. Vernière states that, the extract of nux vomica being inserted in "the paw of an animal after a ligature had been tightened around the leg, so as to stop the venous, but not the arterial circulation of the limb, blood drawn from an orifice in a vein between the wound and ligature, and transfused into the vein of another animal, will excite in the latter the usual effects of the poison, so as even to cause death; while on the contrary, the animal from which the blood has been taken will not be affected at all, if a sufficient quantity is withdrawn before the removal of the ligature."

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[1] Mat. Med., i. 153.

Since Vernière's experiments, however, others have been performed by distinguished physiologists in France, and its action on the system, in consequence of its admission into the circulation, seems no longer to allow of cavil. At one time, the doctrine of sympathetic nervous communication from the part with which it first came into contact to all other portions of the animal body, had gained considerable credence with the profession. The action was supposed to be somewhat like that of electricity on the vital economy; that as soon as the local effect was produced at one point, this constituted the centre from which irradiated general effects over the whole muscular system. Such an explanation was a mere crutch, seized by the physiologist to aid his tottering steps over difficulties, through which his knowledge did not enable him to pass safely. To be satisfied with this, would prevent that careful chemical examination that now enables the experimenter to detect the poisonous agent in the viscera, in so many cases, and by sure and reliable tests to prove its identity. Admit such a theory, and Flandin has truly said, "c'est declarer le poison introuvable dans le corps de la victime." But the results of many examinations have shown, in the expert hands of various chemists, that it *can* be detected in *various* portions of the body after death, and thus is great probability conferred upon the theory of Vernière, that by means of the blood alone does it reach the great nervous centres, and its effects on these are then manifested by all the muscles which derive their nervous fibres directly from them.

Admitting that it enters the circulation, the question for our examination is, in what way does it produce its effects? Has Strychnia any property of *locally* affecting the organs of the body, or do not its effects proceed from some peculiar action it produces on the nervous centres? Ségalas[1] thought that it acted directly on the heart as well as on the nervous system, and endeavored to substantiate this by the fact, that "the heart of an animal poisoned by strychnia or brucia was insensible to the galvanic current." Flandin shows how the very fact that the blood is poisoned by strychnia would make it less fitted to preserve the movements of the heart, and that the destruction of its sensibility must necessarily result from the action of an agent that seemingly first excites the bodily functions and afterwards depresses them.

The effects produced by the action of strychnia manifestly proceed from its action on *the spinal column;* and this is not generally of such a nature as to exhibit any visible alteration even to the scrutinizing examination of the microscope. The muscular system is thrown into violent tetanic action, resulting in decided opisthotonos, and, notwithstanding this, the cerebrum seems but slightly affected, since the mind of the person, laboring under these violent convulsions, may be perfectly clear and undisturbed. His intellectual faculties will be unimpaired by the action of the strychnia, and rational answers will be quickly given in reply to all questions propounded to him. The effect must be slight on the cerebrum, and the whole force of the poison is expended on the medulla oblongata and the medulla spinalis. Magendie proved this years ago. An animal might be decapitated without preventing manifestations of tetanic action after strychnia had been taken, but the destruction of the spinal cord at once checked all manifestations of such action. We should go too far, however, if we were to conclude that there is no effect produced on the cerebrum by strychnia, since the organs of special sense become peculiarly sensitive. There is an exaltation of their powers. The eyelids are closed as though to shield the eyes from an intense glare of light; the ears become appreciative of the slightest sound that is made in the room; and occasionally cases occur where there will be loss of consciousness, as in the first one related by Orfila, where a young man having taken strychnia exhibited at times a perfect want of consciousness. *During* every violent paroxysm there will be a temporary loss of consciousness accompanied by a cessation of the act of respiration; the wide opening of the eyelids and extreme dilatation of the pupils. These symptoms are accompanied with what Orfila called a "véritable état de mort apparente avec les caractères de l'apoplexie portée au plus haut degré."

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[1] Flandin. Toxicologie, iii. 249.

As another indication of the exaltation of the special senses, it may be mentioned that the sensation of touch is made painfully acute, and the slightest contact of a foreign body at once produces convulsions more or less powerful. The effort to raise the eyelid has produced a spasmodic action, which seemed to run through the whole system with electric rapidity. These facts, however, only show that while the powerful manifestations of its peculiar actions are shown in the derangement of the functions of the spinal column, yet the whole nervous system is at the same time more or less affected.

Authors have agreed that strychnia produces no changes in the blood disks, and yet some change must be produced of an important character in the constitution of the blood. Magendie affirmed that there was perfect liquefaction of the blood after death by nitrate of strychnia. Orfila notices that on opening the vertebral column, "there ran out nearly 1 kilogramme of thick blood, very black, viscous, and non-coagulable, which stained the hands;" and that various plexuses of veins were *distended* with dark *liquid* blood. In the case of Dr. Gardiner, the anatomists reported that, "on removing the brain by the necessary division of the medulla spinalis, there was a very copious *flow* of highly carbonized blood from the base of the cranium and the spinal canal." Flandin states that the blood remained fluid in his experiments on animals poisoned by means of strychnia or brucia; and Blumhardt, in his published case, notices the same fact. Indeed, so frequently has this been observed, that we should be justified in expecting to see the blood in a liquid condition in every autopsy made of an individual destroyed by the action of strychnia. This blood has not thus far been examined by the microscope so as to refute or establish the opinion of Müller and Stannicus, with reference to the non-alteration of the blood disks. The liquidity may fairly be presumed to be similar to that found in cases of sudden death by electricity or other causes, acting on the body in full health.

The whole appearance of the body, on the minutest examination after death, fails to present changes adequate to the explanation of the violent symptoms. In this present condition of our knowledge, we are only able to sum up our acquaintance with the modus operandi in the few words, that strychnia acts by entering the circulation through absorption, exerts its influence most prominently on the spinal axis, and to a certain extent also, on all parts of the nervous system, and that animals destroyed by it do not exhibit lesions sufficient to account for the symptoms, although their veins are generally found engorged with dark liquid blood, viscid and non-coagulable.

The effects of this agent, when given in small doses repeated at regular intervals, are of a tonic character. For this reason it has been resorted to in certain forms of dyspepsia, especially where this is dependent on a want of tone in the stomach, and in pyrosis arising from mere "functional disorders of the stomach." Various authorities are cited by Pereira as supporting its use in cases where dysentery and gastrodynia have proven intractable to remedies. Its efficacy evidently depends on the gentle stimulus it gives to the nervous system, which then in turn affords that necessary stimulus required by the muscles in order that their functions may be thoroughly performed. An experience of some years with the profession of this country and Europe seems to have approved and justified its use for this purpose.

Trousseau employed nux vomica in cases of impotence with considerable success, and though the effects were not permanent, yet its efficacy in temporarily removing the impotence was such that he continued to employ it for this purpose with both sexes. Where impotence exists from want of nervous energy, the strychnia appears to induce the necessary stimulation required by the organs of reproduction.

The second effect of strychnia is the production of a contracted state of the whole muscular system. The body assumes a tetanoid condition. There is a super-excitation of the nerves proceeding from the cerebro-spinal axis. We often have opportunities for witnessing this convulsive muscular movement, in cases of those who have been employing strychnia for the purpose of stimulation in "torpid or paralytic conditions of the motor or sensitive nerves of the muscular fibre." Increased sensibility of touch will be perceived. The contact of a slight breeze becomes painful, and that of a solid body produces shuddering and spasmodic movements. The gait is feeble and tottering, and a general tremor pervades the whole body on attempting to walk. Pereira speaks of being able often to recognize its effects on the muscular system, before the patient has noticed any peculiar symptoms, by tapping him suddenly on the ham which would induce a slight convulsive paroxysm. Such patients, when under the operation of this agent, undergo considerable mental agitation, at the appearance of these convulsive movements.

Closely following this condition of the system, is the commencement of convulsions without any adequate cause. The will seems to lose all command over the voluntary muscles, and the hands and legs move in spite of all determinations, on the part of the patient, against motion. There is an indisposition to voluntary motion of any kind, and rest on the back is generally preferred. Such an excitability of the spinal cord has been established, that the slightest impression from without, may be exaggerated by this excitable condition into a reflex action of a violent character.

The cerebrum, however, soon begins to evince some slight proof of the action of strychnia on it. There is an anxious expression of the countenance, and general depression of spirits. The organs of special sense also become very acutely sensitive. But with all this excitement, the mind is able to think clearly and deduce conclusions from premises, with as much preciseness as at any other time. Indeed, in the case of Dr. Gardiner, which will be given in full, further on, there was the most decided manifestation of an intention to deceive, as to the substance taken for the purpose of destroying life; and to suggest another cause for the abnormal symptoms which presented themselves, and this was carried out even to the last paroxysm which closed his life, accompanied by repeated denials, that he was suffering any pain. The denial of sensation of pain was so opposed to the tetanoid condition of the body, that one could only conclude, that it proceeded from a fixed determination not to evince anything like complaint during the deadly action of the strychnia.

This *slight* action of strychnia on the cerebrum may, seemingly, be contradicted by certain post-mortems, which have revealed a ramollissement of the brain. But these cases have clearly shown that this ramollissement is the result of a species of inflammatory condition which the strychnia has established around some apoplectic clot, or deposit in the brain. The rule is, that the mind, during the influence of strychnia on the body, is clear and active.

With all the symptoms we have just described, no indication will be afforded by the arterial circulation that anything of a special character is producing secret, but powerful effects on the system. The pulse will scarcely be at all quickened—but will beat with about the same frequency it would exhibit were the individual in a deep and profound slumber. In Pierre Daste's case, quoted by Orfila, the pulse was said to present no remarkable alteration, and this is the statement with reference to nearly all the cases of which we have any published accounts. Occasionally, a slight reduction may be perceived in frequency and volume; but as a general thing no remarkable alteration of the arterial circulation will be exhibited.

The tetanic symptoms continue to come on with increased force, on the contact of any excitant, if the quantity taken has been sufficient, and at length the full effect of strychnia establishes full tetanus. At first there is a shuddering movement of the muscles, which increases until opisthotonos is produced. The back is strongly bent, so that the body is supported on the occiput and the heels, and the extensors of the lower extremities are thrown into a state of rigid contraction. The arms become stiff, with the hands generally firmly clinched. The muscles of the chest and diaphragm are so strongly contracted, that air is prevented entering the lungs, the circulation is checked, the face becomes livid, or even of a black color, from the enormous engorgement of its vessels, and the lips are puffed out. The impression produced by these appearances is, as though the air were being driven through the mouth, on account of some enormous compression, applied to the diaphragm, operating upwards, and to the anterior walls of the chest, working backwards—and both uniting to express all the air that might be contained in the lungs. This condition may pass off, and all indications of tetanus disappear. If such an interval, as is most likely, occurs, there will be during its continuance no feeling of pain, no convulsive movement on contact with foreign bodies; but a general feeling of weakness and exhaustion will be experienced, inducing the individual to seek sleep. The thoughtless observer might conclude the danger was over. The calm, however, is deceptive. Soon the excitable condition of the system is again noticed—more sensitive indeed than before; all the organs of special sense become exceedingly acute. This state of things terminates in another violent tetanic spasm. The interval may be only from ten to fifteen minutes, or as long as an half hour; and the duration of the tetanic attack varies from one to three, or even five minutes. Each attack, however, leaves the sufferer more prostrated and exhausted than its predecessor, and finally death takes place during a paroxysm, or from extreme exhaustion. In the former case, the state of perfect asphyxia is induced. It is remarked by Carpenter,[1] of tetanus in general, and it is true of this particular form of that disease, that "the functions of the muscles controlling the various orifices, are those most affected; and it is by the spasm affecting the organs of respiration and deglutition, that life is commonly terminated."

This range of symptoms, from slight tonic effects on the digestive organs, up to the powerful agitations produced by tetanus, is very extensive, and the whole are rarely seen in cases where strychnia has been employed as a poisonous agent, inasmuch as a sufficiently great quantity is generally taken, so as to bring on speedily the violent and peculiar effects which are comprised in the word tetanus.

It was denied for years, that strychnia could exhibit any cumulative effects on the animal system, but the case described by Mr. Cooper,[1] seems to show that such effects are exhibited by it occasionally. A Swede had been treated with strychnia for a species of general paralysis; one-eighth of a grain was given three times a day for several weeks; this was increased to one-fourth of a grain, and afterwards one half a grain was given with the same frequency for several days. But one morning he was found in a fit, insensible, his face and chest of a purple color. There was cessation of respiration and but feeble movement of the heart. All the indications of full tetanus had been produced. These passed off, and a short period of comparative freedom from pain then occurred, followed, however, by a still more violent paroxysm and death.

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[1] Hum. Phys., 702.

The diagnosis of a case of poisoning by strychnia,—its difference from a case of idiopathic tetanus is theoretically not very difficult to determine, but in practice, many difficulties present themselves. The symptoms necessarily come on more slowly in idiopathic tetanus than under the action of the poison, and in the latter case they can *generally* be traced as having some connection with articles of food or drink that have been taken. But if the person affected be disposed to deceive, there can be no assistance obtained in this way. In practice so far we have only been able to decide by antecedent and concomitant circumstances.

With reference to the treatment of cases where poisoning has been produced by strychnia, very little can be offered which may be considered as valuable by way of antidote. Lard has been proposed as an antidote, but there has been no definite conclusion arrived at as to its efficacy, and the opinion, based on experiment, is now that it is unreliable. The suggestion is due to Dr. Pindell, an American. It has attracted the attention of various toxicologists, and experiments have already been performed, and more doubtless will be undertaken, with the view of satisfactorily determining so important a matter. Camphor was announced as an absolute antidote, but experience has demonstrated its unfitness for such purpose. Conia, on account of its therapeutic properties being the opposite to those of strychnia, has however more claim on our attention. We doubt, however much may be said of these antidotes, whether it is possible to check the progress of the deadly effects of strychnia, when *it has once entered the circulation;* when it has once produced that change in the qualities of the blood which cause it to engender such abnormal excitation of the nervous system. *Before* the strychnia has left the stomach, nothing could be more efficacious than an emetic, and therefore antidotes would be unnecessary. Judging from the case the writer had an opportunity of seeing, there seemed to be no hope after the full symptoms of tetanus were developed.

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[1] Pereira, Mat. Med., ii. 548.

In order to exhibit the effects of strychnia on the system, or in other words, to show its toxicological effects, two cases are now given; that of Pierre Daste, as given by Prof. J. Cloquet, where the patient lived nearly three days; and that of Dr. Gardiner, who died within three hours and a half. They will exhibit the varieties of symptoms, which have been noticed in cases of poisoning, and will serve to substantiate the statements made in the first portion of this paper.

"Pierre Daste,[1] aged 45 years, of a bilious temperament, took at 9 o'clock in the evening of June 13, 1820, a considerable quantity of bruised nux vomica. Almost immediately after the ingestion of this poisonous substance, he was seized with violent convulsions. He was made to vomit by the administration of milk and warm water. At 10 o'clock, when removed to the Hôpital Saint Louis, his features were greatly altered. Convulsive paroxysms occurred at shortening intervals; their duration being from one to two minutes. They were marked by a rigorous stiffening of all the muscles; the trunk and limbs were violently extended, and the jaws were forcibly closed. The patient uttered broken shrieks and implored prompt relief. The pulse presented *no remarkable alteration*. During the night, *the senses of sight and hearing acquired exaggerated sensibility*. Such was the excitability of the muscles that it was only necessary to touch the patient in order to produce convulsive movements; and the slightest touch only was required to produce this effect. *During* the convulsions the pulse was frequent and agitated, and the patient was bathed in perspiration.

"On the 14th, at 7 A. M., the condition of the patient was more calm; the convulsive movements were less frequent, not so long, nor so violent. * * The pulse presented no febrile agitation. There was a general feeling of weariness and as though bruised over the whole body, but with no pain in the abdomen. At 9 A. M., the convulsive movements had ceased; the storm, so to speak, had disappeared, and everything seemed to foretell a happy termination.

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[1] Orfila, Toxicologie, ii. 605; Flandin, iii. 201.

The insidious calm continued during the rest of the day and night.

"On the 15th, there was the same freedom from convulsions; with a sensation of feebleness and general languor. Some pain in epigastrium in the evening. Skin dry and pulse frequent.

"On the 16th, at 6 A. M., the pulse was small and almost imperceptible. There were dryness and heat of the skin, redness of the borders of the tongue, violent pain in the epigastric region, palpitations, dejection, extreme prostration, regularity of the intellectual functions, staring eyes, and altered features. Death occurred at 10 o'clock A.M. There was no stiffness of the limbs, and a viscid moisture covered the whole body.

"In the autopsy, 48 hours after death, no appreciable alteration was noticed in the meninges of the brain and the cerebral pulp. There were some adhesions between the pulmonary and costal pleuræ; lungs engorged with blood, principally at their base, which looked as though it were painted red. There was a violet color pervading nearly the whole skin, but the shade was more distinct in the lowest parts where the blood had collected on account of gravity." * *

Death seems to have occurred, in this case, *from the exhaustion produced by the previous convulsions*, and from which Daste did not rally.

The case of Gardiner shows more clearly and distinctly, than any other case which has thus far been presented to the notice of the profession, the legitimate effects of strychnia on a constitution in full health.

Dr. George A. Gardiner was convicted in Washington, on the 3d of March, 1853, of the charge of false swearing, after a protracted trial, and was immediately sentenced to the penitentiary of the District of Columbia for ten years. Shortly after the rendition of the verdict, he was observed to take some water from a glass. At this time, it is supposed that he slipped a small paper package, containing strychnia, in his mouth, and swallowed package and contents, as a paper wrapper was afterwards found in his stomach. This was probably about 12 o'clock M. From the court-room he was taken to the jail, and the Deputy Marshal states that he threw up the window, as Gardiner seemed to be suffering from heat, and gave him a glass of water, in accordance with a request made by him. Shortly after this, while attempting to raise a second glass to his mouth, he fell on the floor in a violent convulsion. The attendants raised him from the floor and placed him on a cot which had been brought for the purpose. They spoke of noticing that "he was nervous."

The resident physician of the Washington Infirmary, Dr. Hellen, having been called in to see the case, the writer accompanied him; and from fifteen minutes before 1 o'clock until his death, the case was under his observation. Gardiner lay on the cot perfectly quiet at first; face somewhat flushed, pulse regular and about 90 to the minute. Upon inquiring whether he ever had suffered from an epileptic attack, his brother replied, "Yes, on several occasions," and that the first one was produced by a fall in a Mexican mine. On conversing with Dr. G., he objected to taking some brandy which had been sent for, and said, "Don't give me any stimulus," but consented that cold cloths might be applied to the forehead and temples. Twitchings of muscles began to present themselves, and spasmodic movements of the arms were occasionally observed. On his eyelids being touched, with the view of examining the pupil, a tolerably strong paroxysm was produced. His eyelids, it is proper to mention, were closed all the time, as though the light, which poured through the jail window, was intolerable. In fact the lids were only separated during the convulsions, and then the pupils were widely dilated. His hearing was very acute, and remarks made in a very low tone of voice were replied to quickly.

The extremities now began to move spasmodically, and the whole system seemed to be under the influence of a potent poison. A violent tetanic convulsion occurred, in which the body became quite rigid, the extremities violently extended, the hands firmly clinched, the lips puffed out, and frothy mucus protruded, driven out as it seemed by some enormous force which was producing the total expulsion of the air from the lungs; the hands were of a dark blue, nails blue, face livid, and features horribly distorted. The pulse was very feeble, and hardly perceptible. The convulsion soon passed off, with, however, no decided freedom from the tetanoid condition. Some relief seemed afforded by applications of strong mustard plasters to the ankles.

Dr. Hall arrived about 1½ o'clock P. M., and was with the patient until within a few minutes of his death, giving such medical directions as his own experience seemed to suggest. On asking Gardiner, through his brother, "whether he had taken any poison?" an emphatic "No!" was the answer. He also denied that he suffered any pain, and appeared resolutely determined to suppress anything resembling complaint. His mind was perfectly clear. There were no indications of even the slightest derangement of his intellectual faculties. The convulsions affecting his arms were so frequent and repeated, that a person was on each side, holding his hands, at his request. It seemed that a mere touch was more of an excitant than a firm grasp of any part of the body. He called the writer, and said, with some emphasis: "If I die, I die innocent."

On endeavoring to remove his boots, so as to plunge his feet into hot water, violent convulsions were produced, and every indication of agony was manifest on his countenance. His limbs were so firmly and stiffly extended, that it was impossible to do more than semiflex them, although the toes were somewhat limber. After the feet were in the water some five or six minutes, there was a relaxation of the spasms. But the tetanoid condition gradually came on again, and a most violent paroxysm ensued. There was considerable frothing at the mouth, complete opisthotonos, lividity of the face, entire cessation of respiration, and of the movements of the heart. He was thought dead for the moment by all around him. Gradually, however, the circulation seemed to be re-established, and the respiration to become easy and regular. As the convulsive movements ceased he became calm, and expressed a wish to be left alone, so that he might sleep. Soon, however, the tetanic symptoms again presented themselves, and another, though less violent, attack was experienced. He was much exhausted, as might have been expected, from the immense strain the muscular system had been subject to, but he continued to answer "No!" to the question whether he felt any pain. The strength of will, as exhibited in preventing the utterance of expressions of pain, was most remarkable, and probably has never been exceeded in the case of any suicide.

The physician to the jail, Dr. Semmes, arriving at 3 P. M., the case was placed under his charge. No peculiar symptom of interest was presented from that time up to twenty-five minutes past three, when he died. There would be slight intervals, lasting for a few minutes, of freedom from spasmodic action; and then a recurrence of spasm, until, finally, a violent convulsion ensued, in which the body became very rigid, the extremities violently extended, face livid, changing to a pale and somewhat bloodless hue, eyelids opened widely, and pupils dilated. The paroxysm was protracted longer than any of those preceding it. Exertions were made, in various ways, to re-establish the circulation, and overcome the spasm. All efforts, however, were in vain. Death ensued in somewhat less than three hours and a half after the poison had entered the stomach. An autopsy was held eighteen hours after death, and, from the notes of Drs. Miller, Semmes, and Stone, the following is extracted :—

"*External appearances of the body* rather emaciated. Face, neck, and back, livid; front of the body waxy and pallid; body extremely rigid; deep indentations on the right forearm, from the pressure of the indicator, medius, and thumb, of the opposite hand; articular abrasion of the left leg, in the anterior and internal tibial region, about five inches long by one and a half inches wide; fingers and thumbs were very livid, half-flexed, and slightly elastic.

"*The Head.*—Scalp much congested; the diploe congested, and a discharge of serum as soon as the saw had passed through the external table; meninges of the brain highly congested; the tissue of the brain and spiral marrow presented no abnormal appearances; the arachnoid a little milky in parts. A few minutes after removing the brain, by the necessary division of the medulla spinalis, there was a very copious flow of highly carbonized blood from the base of the cranium and the spinal canal. There was also a trace of a turgescence of the velum interpositum and choroid plexus, hardly worthy of notice. The investing membrane of the upper portion of the medulla spinalis, at its junction with the medulla oblongata, appeared to be slightly vascular.

"*The Thorax.*—Heart small, contracted, and contained no blood. Perfectly normal."

The liver was normal and healthy in appearance, as also were the spleen and the pancreas. The kidneys were, however, highly congested.

On examining the clothing of the deceased, a white powder was found in one of the pockets. This was determined to contain commercial strychnia, or a mixture of strychnia and brucia. The qualitative analysis of the contents of the stomach, made by Dr. Breed, of the U. S. Patent Office, and the writer, furnished satisfactory evidences of the presence of strychnia, with some traces of brucia. There was also found in the stomach several pieces of paper, folded in the form employed by druggists for putting up powders, and comparing in size with the package found in the pocket of the deceased.

Comment is deemed unnecessary on this case, as every professional man will recognize at once the correctness of the verdict of the coroner's jury, that Dr. Gardiner came to his death by strychnia.

II. It is only proposed, in the second part of this paper, to notice the three different methods which have been proposed for the detection and determination of strychnia, when mingled with animal matter. Two of these only are strictly chemical, the third being based on its physiological properties. For a long time, it was believed to be impossible to separate organic alkaloids from animal mixtures without their unavoidable destruction by the heat to which it was thought necessary to subject them. This idea was dispelled when scientific toxicologists commenced examining carefully the processes which would be necessary to effect the elimination.

The difference in two of the processes depends on the method adopted for the purpose of removing the animal matter present. Orfila employed acetic acid. The suspected mixture was treated with acetic acid, filtered, and then evaporated to dryness. The residuum was drenched with alcohol, and, after a second filtration, was evaporated and treated with the proper reagents; or it was again treated with acetic acid, and the acetate thus obtained was employed for the tests. It is evident that the alkaloid must be present in comparatively large quantity, in order to obtain the desired result. The process will answer if such be the case, and, in the examination of the contents of Gardiner's stomach by this method, there was no difficulty in obtaining satisfactory results. This process is, however, not the most delicate, and the alkaloid would be apt to escape detection were it present in very small quantity. It is necessary, then, to resort to the second process.

Orfila, in some of his experiments, employed animal charcoal as a decolorizer; and it is evident, from the peculiar properties of this substance as an absorbent of the alkaloids, that small quantities would be retained in the process of filtration, and thus the process itself would prevent the detection of the poison. Indeed, Orfila seemed to be conscious of the want of delicacy in his process, since he says,[1] "one should be circumspect when he pronounces on a case of poisoning by this alkaloid, and great account should be made of *the symptoms* which were experienced by the person."

The simplest process, and, at the same time, that which is most reliable, is Flandin's (*Toxicologie*, par C. Flandin, iii. 254). He availed himself of the fact that a temperature of 100° C., will not affect the chemical constitution of strychnia, although it will render all the animal albuminous matters present in the mixture insoluble, and will thus prevent them from interfering with the solutions we are hoping to make of the suspected strychnia. The addition of caustic baryta or lime to the animal material, will then cause the conversion of this into other compounds, and into soluble and insoluble soaps. All that would be necessary after the employment of the caustic alkaline earth, would be to employ a proper solvent for the alkaloid.

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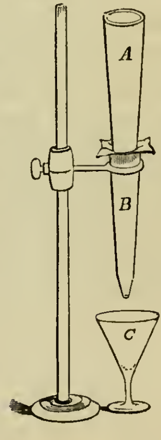
[1] Orfila, Toxicol., ii. 595.

The process in the case of a suspicion of strychnia in animal matter, is as follows: the suspected organic matter is exsiccated in a water-bath, mixed with caustic lime (12 parts to 100), and well rubbed together in a mortar. This mixture is exposed in a water-bath, and the whole is subjected to the action of heat until it is reduced to a pulverizable form, which is then removed, and, after being reduced to a fine powder, is three times heated along with boiling alcohol, and subjected to filtration after it has become cold, when it will be found almost colorless. Now it is evaporated, and the residuum is treated with ether, to remove the fatty matter; this solvent is employed, since the alkaloid and its almost constant associate, brucia, are insoluble in ether. After the removal of the clear ethereal solution, the alkaloids (if present) will be found in the filter either pure or mixed with foreign matters. In the latter case, it will be necessary to treat the solid residuum with acetic acid, dry over a water-bath, and dissolve out by means of water. The acetate of strychnia has its base precipitated on the addition of ammonia, and the precipitated base caught on the filter of Danger, will give the reactions marking the alkaloid. Danger's filter is composed of two tubes—A, the upper, is of a conical shape, and fits into B, which is of a little larger bore. A circular piece of moistened filtering paper is placed over B, and A is then fitted in, holding the filtering paper in its place. The liquid to be filtered is then poured into A, and the solid matter is deposited on the paper as the liquid passes through it in its passage to C.



The physiological method of detecting strychnia has been lately suggested by Dr. Marshall Hall,[1] of England; it consists in employing live frogs, which seem to be most readily excited by the influence of strychnia. Dr. H. found that in the course of two or three hours' immersion in any liquid containing strychnia, the animal would be seized with general spasms, accompanied by tetanoid rigidity. One-hundredth of a grain of the acetate was readily detected in one experiment, and in some others, the one-five-hundredth, and even the one-thousandth of a grain produced the specific effects.

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[1] Chemist for March, 1856, p. 382.

Necessarily the successful application of this test would not *positively* prove the presence of strychnia, but would furnish strong probability of its presence. Where chemical tests, which are necessarily less delicate than this, fail, its employment would be exceedingly useful in a medico-legal point of view, as corroborative of an opinion based on the symptoms exhibited by the person antecedent to death. No positive evidence can be given by a chemist of the presence of any toxic agent, unless he has separated it in one of its definite forms. Such cases may occur where strychnia is present in exceedingly minute quantities, and this physiological test would then become desirable presumptive proof.

Dr. Hall suggests the employment of this test as follows: "In cases of suspected poison from strychnia, the contents of the stomach and intestines, and the contents of the heart, bloodvessels, &c., must be severally and carefully separated, and made to act on lively frogs just taken from the ponds or mud. I need scarcely say, that taken in winter, the frog will prove more strychnoscopic than in summer, in the early morning than in the evening."

This suggestion is a very ingenious one, and has the originality which marks all the suggestions of the distinguished English physiologist.

NOTE.—The following notice of the action of the characteristic tests for strychnia, on that substance and its associate, brucia, is extracted from a highly interesting paper on the subject of nux vomica and its constituents, by Dr. Hirzel, of Leipzig.

STRYCHNIA.	BRUCIA.
When rubbed with sulphuric acid containing one per cent. of nitric acid, and a small quantity of the binoxide of lead, or the binoxide of manganese, it first assumes a beautiful blue, then a violet, a red, and finally a yellow color. This is a reaction capable of detecting 1-1000th of a grain. (*Marchand.*)	Rubbed with sulphuric acid and some of the binoxide of lead or mercury, there is formed a brown, amorphous substance, soluble in alcohol and of a bitter taste; and a blackish red substance insoluble in alcohol. (*Marchand.*)
With sulphuric acid to which a few drops of a concentrated solution of bichromate of potassa has been added, it gives the series of colors just mentioned, but in a still more distinct manner. (*Otto, Riegel.*)	A solution of brucia in sulphuric acid tolerably concentrated, mixed with a few drops of a solution of bichromate of potassa, becomes a pistachio-green, an active disengagement of gas taking place at the same time.
Diluted sulphuric acid, added to a mixture of chlorate of potassa and strychnia, and then warmed, gives on evaporation, a peculiar crystallizable acid—Strychnic acid. (*Rousseau.*)	

Dr. Day's Test.—The suspected powder is moistened with one drop of concentrated sulphuric acid, and then a drop of ferrocyanide of potassium is added, which will produce an intense *violet*, though there should be only 1-1000th of a grain present. This test is not interfered with as much as some others by the organic matter present.

THE MEDICAL PROFESSION AND MODERN CHEMISTRY.

AN ORATION

DELIVERED BEFORE THE

Medical and Chirurgical Faculty

OF MARYLAND,

At its Annual Convention, June 4, 1856,

BY

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OF NATURAL SCIENCES,
(PHILA.) &C.

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ORATION.

THE MEDICAL PROFESSION, AND MODERN CHEMISTRY.

The privilege of appearing in my present position before the Medical and Chirurgical Faculty of Maryland, I count no small honor. The few years, which I have devoted to the study of Medicine, have made me feel of how little avail is the most perfect knowledge of all its principles, unless the opportunities for witnessing their application be many and frequent, and how a ripe experience bears glorious fruit to those seminal ideas, which have been implanted by our forefathers and carefully nurtured until the sturdy tree has been produced for the admiration of the world. Hence on annual occasions like the present, the young prefer to hear the words of the experienced members of the profession, to catch the droppings of a wise experience from the lips of a Gamaliel—to imbibe fresh courage for the arduous professional race they have entered upon by hearing how diligence and honest study have won the victory in the past. I feel some reluctance then, in assuming a position which presumptively implies a wide and extended experience on the part of the speaker, and only do so with the hope that the same friendship will mark your criticism that induced you to make your selection for the present occasion.

It would be interesting and pleasant to avail myself of this opportunity in order to pass over, in rapid review, what has been done by the priests of the healing art, since the goddess Hygiea communicated to them from those stores of learning, that her father Æsculapius had acquired, a knowledge of

"The blest infusions
That dwell in vegetives, in metals, stones;"

but this agreeable subject must be waived, since another intrudes its importance, and as more particularly connected with my *specialite'*, seems to claim the short hour alloted on the present occasion. Addressing a body of medical men of the varying ages found in the profession, the experience of some of whom will bear witness to the changes that science has introduced in its principles and in their application, it will not be considered out of place to call their attention to the contributions of *one* branch of science and its *real* value to medicine. This is especially important since its students are sometimes disposed to over estimate its real value, while those ignorant of its principles delight in condemning them as mere vagaries. Let us then look at the nature of the contributions of chemistry to medicine, and their real value.

If we examine the records of the past, we shall find that remedies, when first applied for particular diseases, were either so employed on account of some accidental discovery of their utility, or because a continued series of experimentation had unfolded some peculiar property. In either case the real *modus operandi* was not suspected, much less understood by the physician. His practice was purely empirical, full as much so as that of any village crone, who collects various vegetables, with superstitious respect to the peculiar phase of the moon, and stews her heterogenous mixture, in order to produce wonderful decoctions, that shall be all powerful in the treatment of disease. The larger the number of ingredients, the more complicated the process to which they were subjected, the more certain was the resulting mixture to be efficacious. The result of such experimentation was inevitably the loss of most of the volatile principles possessed by the *vegetable* material employed, and the production of insoluble and inert compounds from the *mineral* material. This was the pharmacy of the past.

The Materia Medica was indiscriminately derived from the three kingdoms of nature, and after subjection to processes that produced these results, it was expected that they would prove beneficial in pathological conditions. Here was the great and increasing evil in the practice of medicine from the earliest periods of time down to the beginning of the sixteenth century, and though it now appears here and there in some few cases, it has happily been rooted out of our practice as a prevalent custom. We have learned to see the consummate folly involved in such combinations of medicines, and however much we may lament our real ignorance of their properties, we are not likely to imitate our predecessors, so that this very knowledge of our deficiencies will the better fit us for present and future thorough examination.

Permit me first then, to ask your attention to the condition of medication before the chemist offered aid to the physician and taught him how to extract the proximate principles of vegetables and to combine minerals so as to avoid the formation of inert or injurious compounds. This is the most conspicuous instance in which chemistry has liberally opened her laboratory to the physician, bidding him enter freely and ask boldly for what he wants, withholding nothing that lies within her power to give, frankly acknowledging where that power ceases, and in all things (when properly understood,) bringing aid and assistance to his professional labors. Not invested with mystery nor enwrapt with forbidding robes, not requiring consultation with the stars nor caring for ominous conjunctions in the heavens, not demanding heavy pecuniary sacrifices nor laying weighty injunctions on perfect freedom of action, it fully unfolds a complete armament of remedies which can be made available in proper attacks on disease.

A curious specimen of a practitioner, who followed the loose and unscientific method of the middle ages, was afforded by England, even as late as the middle of the seventeenth century, in the person of Dr. Nicholas Culpeper. From his published works, which have survived to the present day, we can obtain a very good idea of the principles, if I may be permitted to call his rules for the treatment of disease by that name, in accordance with which he proposes the selection and determination of remedies. He considers the planets as exercising a most important influence on the nature of disease and the nature of remedies, and quaintly says:* "You may oppose diseases by herbs of the planet, opposite to the planet that causes them: as diseases of *Jupiter* by herbs of *Mercury*, and the contrary; diseases of the *Luminaries* by the herbs of *Saturn*, and the contrary: diseases of *Mars* by herbs of *Venus*, and the contrary. There is a way to cure diseases sometimes by *sympathy*, and so every planet cures his own disease; as the *Sun* and *Moon* by their herbs cure the Eyes, *Saturn* the Spleen, *Jupiter* the Liver, *Mars* the Gall and diseases of Choler, and *Venus* diseases in the Instruments of Generation."

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*Culpeper's Verbal V.

Culpeper was the last remnant of the Astrological doctors who had accumulated wealth and quasi honors by unintelligible jargon and mystical nonsense. His example, however, is a fair one of the profession's command of the materia medica in the previous century, when such language as I have quoted, was not uncommon in their writings. The *vis medicatrix naturæ* proved powerful in cases of disease, in spite of the nauseating or inert remedies with which the sick body was plied, and fortunately for the world, the strength of man's constitution proved to be more than sufficient for the mastery of the disease and the medicaments employed.

In the early portion of the sixteenth century the first steps to inaugurate a new era were taken by a bold and energetic intruder on old prerogatives, one whose name deserves to be held in grateful recollection by the profession at the present time, as that of the harbinger of good tidings to them and to the world. Paracelsus came before the world with much to displease and even disgust. His character was so overladen with gross faults and glaring vices that the first glance at it must excite anything but a desire to obtain a fuller and more perfect view. Yet to him we owe the abolition of the old system of prescription, and the inauguration of the new era, in which investigation was required as to the efficacy of a remedy and the cause of such efficacy. The rude and bungling efforts of chemistry, then in its infancy, were solicited in such investigations. For the first time, the science of the Elementary Composition of matter was brought to work, faithfully and well, for the profession of medicine. The results are before the world. The experience even of many members of our State Faculty has witnessed the most astounding results in the way of substitution of minute quantities of medicines for the large doses they were obliged to employ in their youth.

We are not able to trace the gradual changes which were brought about by the idea of Paracelsus,* that chemistry must have, under its own control, the preparation of medicines, and must exercise a general superintendence over "the healing art." This idea has grown to larger and fairer proportions with each succeeding year,—has developed a comely and beautiful tree whose branches are for the healing of man's infirmities. Each succeeding bold observer has increased our knowledge of remedies and their preparation, but it was left for the present century to claim as its sons, a Caventou, a Sertürner, a Pelletier, who could extract, in their simple and uncombined form, the principles which were alone active in vegetable remedies. Need I give stronger illustrations of the value of chemical investigation to medicine, than the mere mention of Morphia with the name of its discoverer, the chemist Sertürner, of quinia and strychnia with their discoverers Pelletier and Caventou, or of a number of other substances now in daily use, tried and approved as most convenient and efficient agents. And yet when I look over the list of the organic alkalies and find an hundred already definitely determined, all of them endowed with specific properties—the day seems not to be far distant when the whole series of remedies shall be furnished in highly concentrated forms. The past bids us confidently look forward for the most successful results. Chemistry has acquired strength and experience by her labors, and medicine reaps the benefits of those labors.

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*Thomson's Hist. of Chemistry, I. 168.

In this department then of our common profession, the real value of chemistry cannot be too highly estimated. To ignore its value here, is to deprive ourselves of the use of those things which are beginning to constitute the only reliable articles of medication, and to leap out of the progress of the present into the dull stagnation and cold mysticism of past centuries. The progress indeed of the present age has been in no instance better represented than in the history of chemistry, and the aid that its youthful ardor and vigor have brought to the veteran profession of medicine. There is something grand and glorious in this assistance which one science lends to another, something which shows how the amenities of science consist ever in aiding each other to furnish the speediest and most efficient aid to man in his extremest need.

In Physiology and Pathology also, chemistry has not been unmindful of her duty to the healing art. From the time, when Van Helmont, at the head of the party of Iatro-chemists, first advanced the theory of urinary calculi, down to the present, many of the mysterious phenomena of vital actions have been gradually made more and more intelligible by chemical assistance. Then we were taught, for the first time, that calculi were not the same as common stones but were formed from solid substances, which having been in solution in the urine, were precipitated from that liquid on something that acted as a nucleus. The composition of these calculi was not at all understood by Van Helmont. His explanation points to their necessary composition of the carbonate of ammonia, since he considered them as all produced in the same way that alcohol causes a deposit in "*the spirit of urine*," which liquid seems to have been composed of nothing but "a strong solution of the carbonate of ammonia." Since then, what has not been done in this department alone? Urinary diseases have formed the subjects for a specialité of study. The nature of urinary deposits has been from time to time more and more studied; the perfection of the microscope enables us to examine these in their smallest and most perfect forms. The shadow of doubt that might linger, when isomorphous bodies are in the field of this instrument, has been dispelled by the aid of micro-chemistry. The old name of urinoscopist applied as an opprobrium in the profession, and worn with unblushing effrontery *out* of it by the daring and presuming quack, has lost its degrading signification and assumed a high and honorable meaning. The science which, not disdaining small things but delighting in the investigation of their ultimate significance, has invested this name with a credit and an honour, fully equal to that designating the student and cultivator of any other medical specialité. The glory of paving the way for this end was due to the Dutch chemist, whose merit, according to his biographer, consisted "in overturning a vast number of errors, both theoretical and practical, and in laying down many principles, which for want of erudition, have been frequently assigned to modern authors."

The peculiar chemical actions, that take place in the process of digestion have also aided us in understanding how vitality acts through certain laws which have been made intelligible to man, but which are held under certain restraint by others beyond mortal ken. The case of Alexis St. Martin, afforded us opportunities to know what were the results of digestion with different articles of food, and the time required to produce these results. The careful examinations of Prout, in his masterly production, gave us a division of these articles of food into four classes or varieties, composed of substances which were as unlike in their chemical composition as in the processes they underwent in the stomach, and the uses for which they were intended. Chemistry taught us how the saccharine and oleaginous portions of food were altogether different in their uses from the albuminous and gelatinous, that the presence of nitrogen in the latter showed they were for higher and, so to speak, more important purposes than the former. The necessity, however, of the two classes of nitrogenous and non-nitrogenous articles in our food became more clearly recognized as the matter was studied. The former are the producers of the plastic material which the vital force required in order to build up living tissue and the latter, although contributing to the accumulation of adipose tissue and the upbuilding of nerve structure, still have, as their great end and use, the formation of that mysterious equilibrium of animal temperature which resists the depressing and deadening effects of polar winters, and the exhausting and enervating influences of the tropical sun. One is required to keep the animal system in perfect repair; no springy elasticity of a muscle must be deadened;—there must be no injury to the columns of the structure by the abstraction of the material which binds the support of the limbs together in the form of strong and tough bones;—no loss to the delicate structure of the sensitive nerve tissue which gives its still more delicate and intelligent centre, the brain, the command of the movements of the whole body like that possessed by a commanding officer over a body of well disciplined and drilled troops;—no alteration of that life current, the circulation of the blood, in its continuous round of duty as the carrier of fresh plastic material to all portions of the economy, and the remover of worn-out and hence, useless atoms, that have already performed their task of duty and are now to be sent forth into the world to form new compounds which shall, by a slow and gradual, but sure metamorphosis, be eventually introduced into other living bodies to resume similar tasks, and repeat similar offices;—no cessation of the mysterious formation of secretions to lubricate and keep in perfect working order, organs whose delicate structure requires them to move with the smallest possible amount of friction;—no pause in the work of excretory organs, as they remove by drains and sewers of the most perfect construction, the material that the circulation has gathered up as of no further utility or that which cannot be appropriated for any purpose whatever although it has been combined in our food along with the necessary and vitally important. What a series of wonderful and consummate instruments! All under the influence of vitality, but requiring regular supply of nitrogenous food in order that their normal force and utility can be preserved.

The non-nitrogenous articles of the food serve to establish, by the very oxidation or combustion they undergo, the heat which it is necessary should exist in order that all the varied portions of the vital system shall be retained in a suitable temperature for their healthy and normal action. Besides this, they also aid in the formation of those deposits which fill up the interstices existing between muscles, there acting for the physiological purpose of protecting the body from external injuries and as a nonconducting covering to prevent a too free communication with the external temperature, concealing also angularities that would offend the eye and serving for the æsthetic purpose of giving beauty and grace to the animal form.

By our knowledge of the requirements of the system and the character of the various articles of food, we are prepared to select those which will most certainly meet its wants. Our reasoning is not based upon mere assumptions, but upon the firm stratum of facts. Now, the value of a knowledge of the chemical constitution of food is so apparent in a multitude of cases which present themselves at first thought to the profession, that I need not dwell longer on this subject. We are all employing the results of chemical investigations with reference to food, though we seem to be singularly unmindful of the very science which has given them birth, singularly forgetful that this is a contribution to our knowledge belonging almost entirely to the present century, and a result obtained through the recondite and abstract workings of the laboratory. The sum of our knowledge on the subject is by no means complete. Each year adds something. The experimenter has taxed his intellect with the question, "*how* can the various articles of food be preserved so as to avoid the eremacausis or putrefaction to which they are liable, if left unprepared and unprotected from the ordinary agencies of heat and moisture." The possibility of long voyages by sea, or journeys by land depends upon the nature of this answer. It has been given in such intelligible language that the capitalist has undertaken its application, much to the benefit and even preservation of human life. The vegetable articles of food, so necessary to the perfect preservation of life, and whose absence prove so prolific in scurvy and the other diseases that an improper character of food always engenders, are now freely furnished to the sailor, on the rough waves of the ocean, not as a mere luxury, but as an absolute necessity for his health and life. And experiment has not ceased here, it has seized the nutritive matter in meat, combined it with farinaceous material, and, in a dry and compact form, has furnished in most concentrated condition, the various kinds of food which the animal system demands.

These contributions to medicine have given aid to an intelligent comprehension of disease. They show the material necessary for the support of the body, and we are able thus to account for the low condition of health in those whose food does not contain the proper amount of material to sustain the vital actions in their normal condition, and also of those, whose food, without being scanty, has been subjected to such changes as have converted it into poisonous rather than nutritious substances.

But if we examine another of the great processes of the body, equal in importance with digestion, and conjointly with it constituting the keystone of organic life on which depend all the other functions of secretion and excretion, of absorption and exhalation, and to which they owe even their necessity and existence,—if we examine the process of respiration, as connected with the circulation, we shall be able to see that, here chemistry has also thrown in no small contribution to the aid of medicine. What has not been done, since the priceless value of oxygen gas to man's health and strength has been clearly understood, in the way of a general adoption of hygienic means to ensure a full and adequate supply of this agent? Is not the whole system of proper ventilation due to the first discoveries of the pioneers in pneumatic chemistry? The close and confined air of chambers had probably proved detrimental to the health of thousands, and yet the cause was left until the close of the last century, involved in darkness and obscurity. Now we know that as it is a man's birthright to enjoy the blessings of the pure air of Heaven, he is also by right of his birth necessitated to make use of this air in its purest condition without let or hindrance. And moreover, with each act of respiration, the exchange he has made for the aeriform contents of his lungs with the air around him, gives to the latter a principle which is of deadly potency, when present in large quantities, creating the necessity for the preservation of a free circulation of air, as well for bringing that which is pure as taking off that which is impure and poisonous. Who can tell how many stout, healthy men owe their lives to the discovery of these facts, or how many of the beautiful and graceful women of our land are also indebted for the glow of health that covers their cheeks and the never-tiring elasticity and sprightliness of their spirits to the same? The patient is no longer condemned to the close and suffocating atmosphere of rooms with every window and door closed, every chink and crack carefully filled up, to piles of bed clothing and other rude tortures which our fathers in medicine deemed necessary to impose upon the sick; but the free admission of the pure air ensures the speedy removal of those gaseous emanations that are given off from the body, and produces grateful and stimulating effects upon the whole system. Has not the treatment of small pox, scarlatina and various other eruptive diseases been perfectly revolutionized in proportion as the absolute necessity of pure air was comprehended by the profession? The hot, diaphoretic teas, tightly closed and highly heated rooms and thick layers of blankets, the enervating effects of a continuous exhausting flow of perspiration, the suffocating and noxious odors—all these belong no longer to an enlightened practice of medicine. A trace may perhaps here and there linger in the practice of some veteran, whose respect and love for the past requires him to overlook all its gross ignorance of the lights which chemical and physiological science have brought out for the better reading of the needs of the living being. Yet this trace seems now to bear no more comparison to the general practice, than the superstitions, which linger on the mountain side with regard to the great influence of the stars and planets on human affairs, or the significant meaning of signs and omens do to the general spread of intelligence thoughout the world. It is like some fossil that has been exhumed by the diligent naturalist from a deep stratum—an expressive testimonial of the past, but a non resident of the present age. A new era has been established and he that would compete with his brethren in the field of practice, must accustom himself to its laws and usages—must learn the laws which have produced its principles.

The journals of the day give us interesting accounts of the labors of Bernard, Lehmann, Poggiale and Figuier with reference to the glucogenic, or sugar forming function of the liver, and our views as to the presence of sugar in the body are beginning to undergo great changes. A few years since and the appearance of sugar in any of the secretions would have been considered as the death-knell of a patient. He would have been submitted to a strictly meat diet, deprived of those little luxuries which give relish to food, and, by a slow and torturing process, would have been hastened on to the confines of the grave. Its mere appearance was considered sufficient to justify the opinion of the medical attendant that Diabetes mellitus was established. Now, sugar is admitted BY ALL, to be at least an occasional constituent of some of the fluids, and many insist upon its being a regular and normal product of one of the viscera. In either case, we are not induced to form any unfavorable prognosis from the fact of its presence. The experimenters, whose names have been mentioned, are examining the subject with that ardor and zeal which seems to ensure a full clearing up of the whole matter, and we may reasonably expect that, the way being opened for a more rational theory on the subject of the presence and uses of sugar in the economy, a more rational method of treatment for those cases where it is in excess will speedily be adopted.

Need I call to the recollection of my fellow members the fact that only in this decade of years has Therapeutics received from the hand of Chemistry the proper mode of treating Colica Pictonum, and removing the serious effects which Lead produces on the animal system. What value attaches to the use of Iodide of Potassium, in these cases, the experience of many has most liberally shown since the first proposal of the remedy, and Melsen's name has been numbered among those who have contributed, to the enlargement of the field of successful medical practice, by their chemical knowledge.

But the instances accumulate so rapidly, that their mere enumeration would weary the patience, and would not prove the utility of Chemistry one whit better than those I have mentioned. It is of far greater importance for my present purpose to bring up these *striking* instances for consideration, and then to look at the real extent of the aid Chemistry can give to medicine, and why it claims attention, most careful and strict, from every member of our profession. From results, we can all the better go back to the causes which produce them,—even to the fountain head that ever sends forth some additional rill gushing from the immoveable rock of truth, trickling down its unadorned and rugged sides, leaping gaily along the channel it has worn out from the soil, ever increasing in force and strength by collecting from tributaries that pour into it on the way, and at last forming the majestic river which moves onward in powerful current, to the great ocean. Who shall stem its onward progress, or endeavor to prevent its waters from performing their mission in bringing to arid and thirsty banks that moisture, which causes meadows to clothe themselves with the green and joyous garments of spring, and trees rejuvenated and bedecked with richest foliage, to become vocal with the songs of countless birds? Who shall say, *thus far* shalt thou go and no farther? Who shall succeed in rendering its waters foul and muddy by stirring up the bed along which it flows? And yet there are those in the world who have lived many years without being conscious of the agency of such streams in imparting life and health and vigour to exhausted nature. And there are those also in the profession who constantly employ the results of scientific experimentation, without once dreaming that it is their privilege, nay, their duty to hunt out the cause of these results, to investigate the branches of study which have proven so beneficial—so invaluable to their own progress; and not to slight such knowledge by the malicious shrug of the shoulders and the cant phrase "it is not practical."

Ingratitude has always been considered as one of the least pardonable offences that man can commit in the social and business relations of the world. Our sense of right, rebels at intentional neglect or forgetfulness of those benefactors who have given aid and assistance in the time of want and need. The moral sense of a community is outraged by any glaring instance of this sin, but does it become any the less a reflection on the character of the offender if he be found availing himself daily and hourly of the assistance of any branch of human knowledge, without rendering it that credit which is its due, or even still more without acknowledging that its existence is necessary to the full support and maintenance of his own position?

An indissoluble bond binds all branches of science together. A chain whose links can never be burst asunder, is thrown around them all. Like the bundle of rods in the fable, united, they can resist all efforts to destroy them—remain firm against any hostile attempts; divided they are liable to destruction. Hence the necessity of preserving the intimate relation which binds collateral branches together, bringing them in close contact where they can interchangeably give and receive strength and support. Or rather permit me to compare them to living branches of the same tree, drawing sustenance through one trunk from the mother earth, connected by vascular tissue which by many an anastomosis and inosculation makes an injury done to one branch in some way or other affect the whole. And this stately tree of science—can we content ourselves with merely viewing its external grace and beauty without looking into laws that underlie them, and occasion their very formation?

No enemy to progress is more sure of its end than an ignorant employment of new discoveries. Coincidence of cases may occur, where such discoveries would at once apply. The chances are, however, that such coincidences will not occur, and hence failures attend the attempt to employ them, and prejudices are excited that throw the world back into the errors of the past, and cause it to embrace them with the most tender and ardent affection. Not unlike is this ignorant use of science to the loaded firearm in the hands of the child. There is much more probability of injury to itself than to any object around. The slumbering gases, confined in the thimble full of powder employed have the power of doing a great work. There is nevertheless needed an intelligent mind to superintend their employment, otherwise their power is likely to be exerted on him who endeavors to use the firearm. Then, we appreciate the logic which satisfies the child, that after all, a gun is no very great instrument and that it stands in small comparison along side of the bow and arrow, or even stones for destructive purposes, with which latter instruments by the way, he is perfectly acquainted. Does not the old adage run thus, "*a burnt child dreads the fire?*" He has performed the experiment, and feels bound to act in accordance with the law, *exuno disce omnes*. If experience teaches, surely he has learned something. Learned what? Learned that gunpowder is useless and at the same time dangerous to him who employs it? Learned that bows and arrows are more available than fire-arms? No! if that were all, he would have conned his lesson very imperfectly.

The true deduction from his own case would be, that his ignorance of the properties of gunpowder was so great, that he is not fit to employ it until this has been removed. But the child unfortunately does not reason thus. He either avoids fire-arms from unpleasant associations, or uses them in a most indiscriminate way. And thus is it with the ignorant physician, who seizes a new discovery in his profession. The first failure causes him to reject all innovations with scorn, or he proceeds, in despite of it, and indiscriminately uses the new discovery for all cases that may come under his observation. Thus he either acts from prejudice against progress, or from blind love of innovation, from a foregone conclusion that the sum of human knowledge has been complete for years, or that every vagary of an idle mind is more calculated to suit the wants of his profession than the established facts of ages.

To understand the true province of a science—the peculiar aid it can bring to any pursuit, and the limits of its sphere of usefulness; these are points of knowledge which must be mastered before its facts can be properly applied, which must be laid fully before its students in order to prevent extravagant expectations and unjustifiable pretensions. From a misapprehension of their real nature, all the throes of genius will only result in the production of pitiful abortions, and modern illustrations will abound of the truth of the Horatian line, *parturiunt montes et nascetur ridiculus mus.* The misshapen and deformed monsters which have been thrown over the land by such parturient minds, effect the observer only to disgust or excite the most lively sympathy for the parents' misfortune that has had deformity and ugliness, instead of grace and beauty, as the distinguishing traits of its offspring.

The limits of the sphere of chemistry as applied to medicine have been very little respected by the members of the profession. Even to the enlarged vision of Paracelsus, it was by no means apparent how broad a space was covered. With him it was narrowed down to the mere preparation of drugs and medicines for the healing of diseases. But at the present time the opposite is the prevailing error. Those who have given any attention to the subject are too apt to see *no* horizon properly bounding their range of vision—one wide plain, abundantly fertile in all that can please the senses of man, seems stretching towards the far off infinite, embracing and including everything in the world besides. There is small danger in the present age, of our going back, as a profession, to the narrow and contracted views of Paracelsus. But the danger is great and imminent that, we may fall into the second error and endeavor to bring all nature, whether inanimate or animate, under the sole control of chemistry. On what point does the danger of the second error rest? An examination of the answer to this question will be really a species of negative reply to the question, "what is the real value of chemistry?"

I would designate as the point of greatest danger to the professional thinking of the present day, a want of reference to the existence of a vital principle permeating every nerve fibre, every muscular fibril, every microscopic cell in the living organism, whether plant or animal, and exerting its mysterious sustaining and controlling power in all these in a way that is beyond the ken of human being, and which was intended to be kept from his knowledge for purposes that are known to the Divine Author, and to him alone. Here is the great error, the hidden rock on which many a beautiful theory has been shivered into a thousand pieces.

An illustration will show the truth of this proposition. When Beaumont found that the gastric juice of St. Martin would digest in a way similar to chlor-hydric acid the food of the stomach, it was not thought sufficient to deduce the proper conclusion from this, that the latter acid constituted a *portion* of this juice. Another conclusion was jumped at, that the gastric juice was *mainly* composed of this acid and that the *whole* process of digestion was a mere *chemical* operation that could be as thoroughly accomplished in the laboratory as in the stomach. Further experiments showed that even the announcement of the composition of the fluid was premature, since this peculiar acid forms but a small portion of the gastric fluid. But the erroneous views into which the profession were led by this chemical theory of digestion were quite numerous, and extended far beyond the theories that were formed as to the causes of the diseases of the digestive organs. What blunders must have been committed by those who groped along in this darkness, we shall leave undisturbed in the records of the past. When the fact, however, was understood that digestion, although partly attributable to chemical actions, yet was a *vital* process holding such actions under a species of control, then, for the first time, was a proper appreciation of its true nature secured and we were prepared to understand what remedies were required in certain pathological conditions.

The great blunder consisted in the nature of the viscus being forgotten, in which the operations in the body take place. It is not an article made out of material different from the fluid it contains as would be the case with the porcelain or glass ware of the laboratory, but composed of the same substances, nay, being the very producer of these, the source of their formation. If there were nothing else than mere chemical action, involved in the process of digestion, what protection would the coats of that organ have against their own destruction,—how could the secreted fluid be so powerful in the way of reducing all food to one homogenous mass, and yet be perfectly innocent of any injury to the walls of the stomach? Chemistry fails to account for this. It is not her duty to account for it. Her work has been carried on under the control of another power which has permitted the chymefaction of varied kinds of food, but by a mysterious endowment of life, has protected even the delicate mucous lining of the stomach from injury. Vitality has employed chemistry to work and assigned her definite limits. When vitality ceases this supervision of the work, then chemistry has no restraining power over her, save her own laws; and mucous and muscular and serous coats are all speedily attacked and alike made to undergo metamorphoses, that ensure the disappearance of complex, highly organized forms, to reappear in those which are simpler. The chemical theory of digestion was fair and specious at first sight, but it could not withstand examination, much less the shock it received from experience. The chemico-vital theory opens another field. Man has learned where his ability to control this process of nature must cease, and hence though the range of his field of study and experiment has been greatly reduced, yet the results, now obtainable, are likely to withstand proper and suitable tests.

It is not the province of chemistry, nor of science in general, to explain absolutely the phenomena of living beings. These may be in part chemical, in part physical, but they are always vital. But a few years have elapsed since the electric theory of life was proposed. The action of nerve force was seen to be instantaneous and to resemble, in many points, the electric fluid. A certain order of mind has the peculiar faculty of leaping from resemblances to positive conclusions as to identity. No space can be too great for it to pass over at one bound, no obstacles too numerous or great to interfere with the rapidity of its movements. To pass from the fancied resemblance to the positive statement that electricity and nerve force were, identical; was but a small task for such a mind. And now began a series of ideas, each more unfounded than its predecessor—at first merely whimsical and chimera-like, then more and more outré, until finally the baldest materialism intruded itself and the theory became monstrous. For it seemed as if the application of the idea of electrical causes for minor phenomena could not be sufficiently comprehensive to satisfy these sciolists, and therefore to make it larger and more comprehensive, life itself was declared to be but a phase of electricity. Then the step was a small one to the silly conclusions of Crosse and Weeks, who claimed to have originated living beings by the mere action of electricity on inorganic matter. The theory had been carried out to its fullest extent. All its gross and impious deformities exhibited themselves in the shape of an infidel materialism, too repugnant for any one to tolerate, unless all the sacred recollections and associations of his youth were to be banished from memory. The necessary reaction from all this would have been a denial of the agency of electricity in any of the vital phenomena, had not prudent and careful men been experimenting on its probable presence in the system and the laws which governed it there, together with the action of vitality on it. We have now a young science, vital electricity, which serves to aid in clearing up many an obscure point in a diagnosis and in aiding in the treatment of disease.

The misuse of chemistry in the profession, appears however in more cases than we have time to glance at here. Its employers have always met failures in their practical applications of the theories which would grow out of such misuse. They have been forced to see, that as the eras of *Solidism* and *Fluidism* had lived their day and been finally forced to die from marasmus, so would all their theories fail to inaugurate an era that should exist any longer than the time required to show their fallacies, and to make way for the appearance of something more durable because more true. The true theory of animal action consists in adopting none of the defunct theories of the past absolutely, but in admitting the presence of a vital action which holds the physical, chemical, and electric actions under a proper rule, causing them all to work unitedly for the good and well being of the organism. The stomach is not a laboratory, but chemical operations are carried on in it with a peculiar kind of restraint attached to them which invests them with a special character. And the same holds with reference to all other chemical actions in the organism.

The true value of chemistry to the medical profession might be deduced from what has been said of its misuse, and of the errors which have arisen from a false conception of the character of all the actions of vitality. but it seems proper to dwell more specially, on this subject.

What it has done in the past would exhibit a value and importance, that cannot be gainsayed. The benfits which have accumulated from its aid are so intermixed with the present knowledge of the profession—so combined with other subjects of our study, that by simply separating and eliminating them, a striking exhibit could be made of its real value. I prefer, however, to say a few words with reference to its value to the future of the medical profession. There never has been a time in the history of the latter, when its importance and dignity was so fully established. when the storms that had lowered o'er its head were so thoroughly and completely dispersed. It has lived down all aspersions that the malice or envy of the wicked have thrown against its fair fame. and with ever increasing strength and beauty has become more and more worthy of the admiration of the world. Its foundations have become deeply rooted in the earth. and with a stability that must encourage all its sons, it claims one of the highest places among the callings of men. The lines of one of its gifted sons, the genial Holmes, describe in the most striking manner how :

"Its hoary forehead rears
The towering pride of twice a thousand years!
Far, far below the vast incumbent pile
Sleeps the gray rock from art's Aegean isle;
Its massive courses, circling as they rise,
Swell from the waves, to mingle with the skies;
There every quarry lends its marble spoil,
And clustering ages blend their common toil;
The Greek, the Roman, reared its ancient walls,
The silent Arab arched its mystic halls;
In that fair niche, by countless billows laved,
Trace the deep lines that Sydenham engraved;
On yon broad front that breasts the changing swell,—
Mark where the ponderous sledge of Hunter fell,
By that sharp buttress look where Louis stands,
The stone yet warm from his uplifted hands;
And say, O! science, shall thy life-blood freeze
When fluttering folly flaps on walls like these."

The value of chemistry to the physician may be considered as three fold, viz: in its applications to physiology and pathology, to materia medica and pharmacy, and to hygiene. A few words on each of these applications may be permitted me, in order to show that chemistry has not exhausted all its energy by contributions in the past, but is still rich in ability for new discoveries in the future.

Although I have insisted upon the fact that chemical changes *in the* body cannot be considered as identical with those which take place in the laboratory, on account of the regulating and controlling influence of vitality, yet it is not desirable that the other conclusion should be adopted that there are no such chemical changes, and that they cannot be considered as taking place in accordance with definite and fixed laws. All the tissues are composed of definite proximate elements and these again of ultimate elements grouped together in a highly complicated manner. Their normal constitution being thus fixed, when disease invades the system, its effects must often be evinced in some change of tissues or of secretions poured forth from them. In proportion as we understand their normal composition will we be enabled to appreciate any changes that have been produced in it. The department of pathological chemistry cannot be understood unless physiological chemistry has preceded it, and both are as yet, in their infancy. We have before us as questions, the nature of the normal structure, and the cause of those peculiar changes which occur in it; how comes it that vitality which has controlled the chemical actions so far, has permitted them now either to escape from its control or perchance to take on peculiar processes not recognized before :—how happens it that a peculiar waste of the body attends the appearance of a certain substance in the urine? These and a thousand other questions are within the range of chemical research, and can be investigated fairly without any danger of the mind running into materialism. They invite study and hold out honorable rewards to any one that will diligently labor in this field.

Again; the mysterious operations of the nervous system have been up to this time but slightly examined. The wonderful character of this peculiarity of the animal kingdom alone, with the inconceivable rapidity that impressions from the world without are transmitted to its grand centres, and *how instantaneously* the will is supported in all its determinations by the muscular system, this also opens a field for examination as to its composition and nature, in a fuller and more through manner than has yet been done. There must be chemical changes in every sensation that is transmitted over the nerves, since no effect in nature is produced without a destruction of some portion of the material which has been employed in its production. For every effect in animal life there must be a contemporaneous destruction of some portion of the economy, and hence we must apply this general law to the actions of the nervous system as well as those of the other systems which are found in the animal economy. I feel that nothing more forcibly can be said on this subject than has been expressed by Lehman* in these words: "we may rest assured that the nervous system is not exempt from chemical action; and if the nervous system itself must fall within the domain of chemical contemplation, and a chemical expression remains to be found for its action, no less than for that of digestion and for the formation of the blood, it is scarcely necessary to offer further proof of the fact that chemistry is destined to play the most important part in physiology and medicine." Nothing can be more true also, than the idea of this same author, that chemistry as viewed in connection with the phenomena of healthy or diseased beings, is but one and the same in its laws, and hence that whatever is true with reference to the importance of chemistry to physiology is also true when pathology is under examination. Where it does not now afford an explanation, we have the right to conclude it will in the future, if the discoveries of the past are to be taken as any indication of the character of the science. The value then of a science, which is so linked with physiology and pathology, in investigating the various phases of vital action, cannot be estimated by past results or present acquisitions, but must be judged by the boundless field of usefulness which is opened before it in the future. We are but on the confines of discovery. If we shall ever comprehend the true nature of the chemical phenomena of life, we shall be enabled to understand the nature of the control the vital force exercises over it, even though we do not obtain the power to alter this in the condition of disease and restore it to its healthy state.

In the wide field of materia medica and pharmacy the value of chemistry in the future, claims especial attention. Our own Flora abounds with medicinal plants which are by no means inferior to those of other lands, and the mineral kingdom is ever furnishing new compounds with valuable properties. To obtain a proper knowledge of these, and "of all the medicines which the Lord hath created out of the earth," so as to free them from the inert substances with which they are combined is only accomplished by the nicety of chemical manipulation. The complication of formulæ by the mixture of a large number of articles, which excite chemical decompositions and the formation of insoluble and useless compounds must be swept away from the profession. That improvement is needed here, cannot for a moment be doubted by any one who has glanced over the prescriptions put up in a single day, at any apothecary's counter. The most opposite results from those expected are often obtained through changes in the incompatibles which have been thus grouped together. The prevention of such changes can only be effected by an intelligent acquaintance with the chemical properties of these medicinal agents. Every prescription written by a physician with this kind of knowledge will be free from inert substances and will contain in smallest possible space the requisite remedy.

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*Phys. Chemistry, I. 18.

Again; the very selection of remedies must necessarily depend in many cases, upon their peculiar chemical character. The treatment of urinary diseases, we know, depends much on chemistry, at the present time. The deficiences in the urine give true chemical indications of the remedies required. And the microscopist with all the talent and genius he can bring to his work will have accomplished little in the department of urinary deposits, if he is not taught their composition by the chemist. The mere exhibition of forms without a previous knowledge of their composition, is at best, but pastime. The composition being once understood, however, *the forms* serve afterwards to represent it.

Chemistry being the basis of pharmacy, does not ensure more certainty in the elimination of active principles from their vegetable combinations than it ensures enlightened employment of the same with especial reference to changes in the chemical composition of the tissues when the system is laboring under disease.

In hygiene, chemistry has not only taught us the useful properties of pure air and the value of ventilation, but the proper construction of our dwellings so as to combine comfort and convenience, the nature and preparation of the clothing which the varying character of the seasons demands, the nature and effects of the odors given off by decomposing bodies, the value of disinfecting agents and the best methods of preparing them, the priceless importance of vegetable charcoal as an oxidizing agent and an absorbent of gases;—these have been announced as an earnest of its powers and its resources. The health of large communities has doubtless been much improved, and many a life spared by this kind of information which chemistry has thus laid at the service of public hygiene.

But I feel that before this audience, it would be a work of supererogation to dwell at greater length on these points. They are so plain and transparent that a glance serves to make one fully acquainted with them in all their connections. Permit me however to add, that I can see no reason why the science which thus lends aid to all the departments of medicine should not now be considered, as it *must* be hereafter, the basis of medicine. It was well, years ago when our knowledge of the ultimate constitution of matter was so meagre that the Aristotelean doctrine of four elements was universally accepted, to take anatomy as the base and build up the science of medicine on it as the framework or skeleton. But now, before we can even employ this framework, we find ourselves obliged to ascertain what its composition is, and at the initial point of our study, we must have recourse to the aid of chemistry. If we examine the ovum, the very *punctum saliens* of life is demonstrated to manifest itself in a substance of a complex composition, which is invariably the same. The mystery of life, imparting character and form to matter, thus selects one peculiar organic compound, and only one, in which it shall manifest its vivifying powers. Physiology and chemistry spring conjointly into existence, so far as their connection with the living animal is concerned. The one furnishes the material which being vitalized assumes the forms of organs; and their continuous operations, the other watches until the period arrives when vitality ceases, and the first then claims absolute rule again. Now which of these two sciences, nay, of all the sciences that are required by the medical man, and are within the comprehension of finite minds,—which can be considered as of the first rank in importance—the very basis of all? Am I claiming too much, when I say that the only one that can be considered as meeting at all the idea of a basis for all the others, is chemistry? We claim this without desiring to represent the collateral branches of science as of subordinate importance, or to hold up chemistry as the only object of study for the physician. We state our firm conviction, that to it he owes most of that which separates him from the ignorance and superstition of the past—frees him from the charge of empirical practice, gives his treatment of disease a philosophical character that his predecessors with all their longings and strivings were never able to obtain, and elevates him to a position among the benefactors of the human race.

A pertinent question presents itself in this view of the science, which comes home to us all. Why is so little attention paid to the study of chemistry by the very profession which owes so much to its contributions in the past, is benefitted so much by its present aid, and looks forward to the future with hopes based upon its continued revelations? Why does this spirit of inattention date from so early a period in the life of the student, before he has even had a glimpse of what the science includes in its range of study, before his mind has been at all prepared for expressing an opinion on any subject connected with his chosen profession? It will not do to answer this question by the complaint that it is too dry or too tedious, or too abstract. The explanation is *not* to be found in any such qualifying terms. These adjectives have no business relations with the word chemistry. That cannot be dry, or tedious, which opens up so wide a field for investigation of the hidden mysteries of nature,—which shows beauty of design in the composition of the most subordinate parts of the body,—which forms the life of most of the professional investigation and progress of the day. That cannot be dry which is indissolubly connected with every intelligent contemplation of the medical sciences. No! I say this is *not* the explanation. We have often made ourselves believe that such an excuse may justify the carelessness we have shown on this subject, and that our consciences may be invited to take a profound slumber with reference to this carelessness by such an healing balm. But I trust there will be no difficulty in finding that this neglect does not depend upon the intrinsic character of chemistry, but upon two other causes.

First: this carelessness proceeds from a traditional notion, that the science has no reference to the practical wants of the profession,—that it was connected with the other chairs of the medical faculty without a definite idea as to any relation existing between it and them,—that it only consists of physical experiments which have no reference to organic matter,—and that it speculates now, on mysterious combinations, with the same kind of freedom which it evinced years ago, on the discovery of the philosopher's stone and various other impossible things. These traditions have been handed down from preceptor to student, until they have become fixed apophthegms. The indolence of the student. or his respect for the words of the preceptor prevents him from examining into the subject for himself. The libel on the science is retained. He quietly falls into the beaten track and is numbered, so far as his inattention to chemistry is concerned, in the front rank along with his predecessors. And what becomes of him afterwards. as the years of practice pass quickly by, when his experience should enable him not only to cure disease but to lend an helping hand in its explanation? Is he not recognized as the routine practitioner, solemnly marching along the narrow road that the pioneers of the profession have made for temporary purposes, with military precision and rueful countenance moving forward without a glance to the right or to the left, while on either side countless beauties are to be seen, shorter paths freed from all incumbrances abound, and a brighter sun is shining from behind the clouds? And is not the routine practitioner a near relation of the quack? The one, it is true, boldly throws the flag to the breeze and lets the world know what he is, and what relations he holds to it. But the other borrows the mask of professional honor and dignity,and under it, does not hesitate to follow a fixed routine of treatment—becoming a slave to nosology and all its hideous imperfections. The approximation of the two, in character. is very great. Who will declare, which is the more culpable? The question is one that invites some careful reflection.

This traditional notion of the minor importance of chemistry has actually now produced these results. Let it then be removed and linger no longer on the portals of a physician's office—a black mark indicative of a want within that nothing can fully compensate for.

The second cause for this neglect of the study rests often with those who hold the high and responsible posts of teachers. The student who has been carefully indoctrinated in the principles of his profession by an intelligent preceptor, or who has suspected the fallacious character of the traditional notion of chemistry, resorts to the halls of the medical college, in order to obtain fuller knowledge, and experimental evidence of the truths on which the science is based. His expectations may be high, and his visions brigh and dazzling. Youth does not readily—especially in this incredulous age—show respect for authority, unless the reasons for that respect be palpable. The science that he has been pleased to believe is living and active, blossoming with the most beautiful marks of its perfection, which the other chairs of the medical faculty continually refer to as the source of much of their own progress and importance, is at last to be presented in very essence and substance to his anxious mind.

Should he meet with one who lives in the elementary experiments of the past, whose recognition of the discoveries of the present has nothing of that glorious enthusiasm about it that invests the labors of the student of science with so much interest, who has failed to catch the living character of the connection between chemistry and medicine, whose dry and lifeless manner extracts the very spirit from his subject and exhibits only a jejune and exsiccated skeleton. how can the natural effect be prevented of a reaction which removes all the student's enthusiasm and excites perfect carelessness or indifference as to the science? Much, very much, depends on this cause, more than on the first impressions of the student imbibed from the contagious effect of bad example. The teachers of our medical schools are invested with enormous influence, that can be wielded as well for the injury of their very specialities, as for their advancement. Happy he, on whose spirit rests the smallest blame for the production of the former; thrice happy he, who contributes most to the latter! The seed implanted in such soil will spring up and bear, thirty, sixty, yea an hundred fold. What the yield shall be, whether of good grain bearing seed in its turn to produce its kind, or of rank and noxious weeds that shall be alike injurious to the profession and the world, it is the bounden duty of the teacher to have a special care for. On this depends the future estimation which the world shall have of his character,—on this, the verdict whether he has been a good and faithful servant, or an enemy in the camp fighting for the downfall and destruction of his own allies.

Gentlemen of the Medical and Chirurgical Faculty of Maryland. shall our own course be marked with a proper appreciation of the value of this interesting and all-important science, or shall we allow the causes just mentioned to interfere with an investigation of its truths? I know full well, that you are not prepared to admit the latter. The growing interest in the literature of this subject,—a literature which embraces the philosophic German, the sprightly Frenchman, the practical Englishman, and the cool, calculating American among its contributors,—this shows, that there exists throughout our State and in the city where we are now assembled, no small estimate of the subject. The exchange of views that takes place at the meetings of our city and county societies, has been productive of much good in the way of increasing our knowledge of all branches of the profession, and in exciting us to continuous efforts to enlarge our sphere of usefulness. If we act under a conscientious sense of duty, we will zealously endeavor to remove all causes impeding the fullest study of these different branches, and, whether as teachers or as regular practitioners, will work harmoniously together in the good cause. Thus shall we show ourselves worthy members of this venerable association, fit successors to the places which its esteemed founders held among the men of this land,—and inheritors of that spirit of stern and unrelenting opposition to the Protean monster Quackery, under whatever form it may appear, which marked the actions of the incorporators of this Faculty and was impressed upon their charter and constitution. Thus shall we show ourselves worthy of our profession and of an age that is most active in its search for "the right men in the right places."

"THE UTILITY OF COLLEGES OF PHARMACY."

AN ADDRESS

BY

PROF. LEWIS H. STEINER, M.D.,

BEFORE THE MARYLAND COLLEGE OF PHARMACY, NOVEMBER 3, 1856.

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IN MARYLAND.

THE UTILITY OF
COLLEGES OF PHARMACY.

By Prof. LEWIS H. STEINER, M.D.

At the very inception of a new enterprise we know how important it is, carefully to consider the full nature of the field it is intended to occupy, the best means we should adopt in order to ensure a prosperous result for our labors, and, above all things, to fit ourselves well for the task undertaken. Should the enterprise be one of doubtful utility, it is better to look it calmly and deliberately in the face, seriously to weigh the expected results, and to reject all our plans as mere air castles,—than to find, after days of toil and nights of troublous thought, that disappointment and failure are our lot,—that all our enterprise has been expended on what was unnecessary and hence unappreciated by the discerning public. If careful reflection, however, should satisfy us of its utility, nay ! of its absolute necessity, then we may begin our labors with alacrity and spirit, hoping that they shall be appreciated by those for whom they were intended. The persevering spirit and the indomitable will may then be applied to the labor, and the result must be successful in some way or other, even if not in pecuniary gains.

Such, ladies and gentlemen, are the thoughts that come uppermost in the minds of those who prudently undertake new projects,—having first "counted the cost." You are assembled this evening to witness the inauguration of a new College in our prosperous and thriving community. Your presence bids its faculty hope that an approval of its objects is the result of your own thought on the subject. But you have the right to demand from its Trustees, from its Board of Instruction, whether they have discussed the subject of the utility of such Colleges with care and deliberation,—whether the necessity is instant and pressing for the establishment of one within your midst, —and whether the work, however great or small it may be, has been assigned to those who are fitted for its accomplishment. If the answers to such interrogatories should be satisfactory,—we feel that we have the right to demand your sympathy, and your hearty coöperation in our work ; if unsatisfactory, that a merited failure should be our reward, for it is far better that men should totter and fail in their undertakings, than that a community should encourage an useless and unnecessary enterprise, or distract one whit of its energy from the great and important claims of the age, to bestow it upon a doubtful or uncertain plan.

As a most interesting and important subject, it is proposed to glance at the rise and progress of the pharmaceutist's calling, and the advantages, to the community as well as himself, arising from the establishment of colleges where he can acquaint himself with those branches which are required for the successful prosecution of this calling.

Early in the history of the human race, before the mind had even ceased to wonder at the numberless beauties of the early Paradise, while the eye gazed in admiration at the *

> " Groves whose rich trees wept odorous gums and balm,
> Others whose fruit burnish'd with golden rind,
> Hung amiable, Hesperian fables true,
> If true, here only, and of delicious taste.
> Betwixt them lawns, or level downs, and flocks
> Grazing the tender herb, were interpos'd,

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* Paradise Lost, IV.

> Or palmy hillock, or the flow'ry lap
> Of some irriguous valley spread her store,
> Flow'rs of all hue, and without thorn the rose :"—

Early in the history of what is now clothed in all the mystic beauties of dream-land, though then a reality, we learn from the Sacred Record that sin came into the world, bringing with it *disease* and *death.* What is not included in these two words,—what of anguish and suffering to the human race, hours of pain and affliction, of bitter sorrow and keen soul-racking distress,—tears of grief and agony of affliction? From them spring the anxiety which makes the mother's heart throb with sadness as she waits by the bedside of the little infant, who draws life and sustenance from her loving breast,—the bitter anguish of the family at the suffering couch of a beloved and adored parent,—the anxious expectations and dread of the partner of toils and pleasures as she lingers by the side of the husband of her choice,—the weeping and wailing of friends as the strength and manly beauty, and giant mind and great loving soul of some fellow being is about to be lost to them for ever in this world. What hours of unwearying attention through the day, when the world, seemingly unmindful of the sufferings of the afflicted, is rushing along in its course for honor and gain,—through the night, when the quiet and silence makes each minute an hour of pain, each hour a week of heart-breaking anguish,—what sad hours are brought back to the mind by the mere utterance of the word—disease! All the disappointments, that failures in the contest for honor, station, or emolument may bring to the sensitive soul of man, sink into insignificance when compared with the wretchedness and despair that *disease* sows, with a liberal hand, among the sons of men. But the same Providence which sent the fell destroyer to close the earthly career of the immortal being,—which imposed the penalty of disease and suffering for the first great act of disobedience, has also taught man how its severest pains may be mitigated; and, if she so will, how the final close may be postponed to a future day. We read,* how, "The Lord hath created medicines out of the earth; and he that is wise will not abhor them. And he hath given men skill, that he might be honored in his marvellous works. With such doth he heal (men) and taketh away their pains. Of such doth the apothecary make a confection; and of his works there is no end; and from him is peace over all the earth."

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* Ecclesiasticus xxxviii. 4–8.

The history of the various medicaments now employed in the treatment of disease, is enveloped in much obscurity. We are not able in the case of most of them to state when, where, or by whom they were first found to have a medicinal effect on the human system. Far back in the infancy of the race, by a happy accident, if we dare call such an occasion by that name, their properties have been discovered, or by unwearying experiment their efficacy has been determined. Gradually they have been made known to the world. At first communicated with solemn injunctions of secrecy, as heir-looms of priceless value, from teacher to student, from father to son, or with grave solemnity and mystic forms from village crone to a tried and trusty associate. Superstition would necessarily invest the substances, whose properties were thus made known, with more than real properties. It would in course of time gradually surround the *preparation* of the medicine with more importance than the substances which entered into its composition, and the rites and ceremonies then adopted, would be looked upon as the really efficient agents. Such a result might naturally be expected from those who were ignorant of the laws of science. The medicine man, among the aborigines of our own continent, by a series of meaningless rites and terrifying forms of procedure, endeavors to convince the bystanders as well as the sick, that his power is of a supernatural character. The physicians of the more cultivated nations of the globe, not many centuries ago, were not altogether devoid of a similar actuating cause. The more mystery surrounding the preparation of the potion, the more value was supposed to be conferred upon it. The prejudices of the people were availed of in order to control their faith and confidence in his skill. Articles of an inert or disgusting character were taken and combined with the really useful, and the whole was then inflicted upon the patient. The articles contained in the famous cauldron of the witches in Macbeth, were not very dissimilar from those at times forced into use by the practitioner of medicine in the middle ages. Full as outré and disgusting were some of the substances as the

"Fillet of a fenny snake,
Eye of neut, and toe of frog,
Wool of bat, and tongue of dog,
Adder's fork and blind worm's sting,
Lizard's leg, and owlet's wing;

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Scale of dragon, tooth of wolf:
Witches mummy; maw and gulf

Of the raven'd salt-sea shark;
Root of hemlock digg'd i' the dark;
* * * * * * *
Gall of goat, and slips of yew,
Silver'd in the moon's eclipse;
Nose of Turk, and Tartar's lips;
Finger of birth-strangled babe,
Ditch-delivered by a drab."

But the day was near at hand when science should dawn upon the world, and such articles would necessarily be driven out of the practice of the medical man,—leaving their place to be supplied by others of real efficacy and value. From the dusky clouds of the Alchemist's cell, was to proceed a new and beautiful science, which should delight in extracting the effective principles contained in minerals and plants and animals, and irradiant with the enthusiasm of its youthful nature was to seek out ignorance and superstition in all their hiding places, and drive them from the abodes of men. Chemistry paved the way for the appearance of Pharmacy, and gave all the science which the latter possesses, removed mystery from the shop, and made the Apothecary assume a position worthy of him who was to be the Physician's support and assistance.

The origin of Pharmacy, or of that science which treats of "the preparation, preservation, and compounding of substances for the purposes of medicine," is intimately connected with the first appearance of Chemistry. Had the latter never existed, the former would have had no character worthy of the respect of the man of science. It would have consisted, at most, of magic formulæ, disgusting decoctions, inert compounds, and worthless modes of proceedure. No enlightened person would have resorted to it, unless forced by the fear of impending death, and distrustful of the unaided powers of nature to throw off offending matter. The medical profession would have been unable to render relief, even when the nature of disease had been fully discovered and recognized as not necessarily fatal. Its cultivators could have never passed beyond the stage of mere students into the natural history of man,—his physiological condition and the pathological changes induced by disease, with probably a certain amount of surgical knowledge,—over to the high station they now occupy as ministers to his wants and his sufferings. Pharmacy was the science which was to invest them with a perfect armament for use in their professional labors,—to give as much certainty to their professional practice as fallible beings can be expected to possess. Its prosecution was to employ the aid of chemistry in its widest sense, in its most potent processes, so as to ensure the full equipment of this armament.

How interesting does this connection of chemistry, pharmacy, and the medical profession appear to the student of science, interlocking and embracing each other as it were, until the lines which mark the borders become less and less distinct, and the three appear but as members of the great science of Nature,—parts of one vast organism which involves the constitution and properties of all bodies from the grain of sand by the sea-shore, the impenetrable adamant, the one-celled animal whose life is hardly established before its death is at hand,—the vegetable through all its ramifications of form and structure,—up even to the constitution of the brain itself of him who has been endowed with a certain degree of mastery over them all. All the parts of this organism are perfectly harmonious. No discordant sound is heard, but the loud swelling note of praise it sends up to the Heavens above shows that all are attuned by the same great Architect, who has taught man how to find out their hidden truths and sacred laws.

Pharmacy, with which as a profession we have especially now to do, did not spring up at once in all its strength and power from the seed sown by chemistry. Its first steps were like the first efforts of the infant to walk. Many a fall to the ground, many a lapse into the errors and superstitions from which it had just escaped, many a tottering step, was experienced, before it planted the foot securely on the firm basis of truth and advanced steadily forward, growing in time to the stature of an adult, remarkable for strength and beauty. How could it be otherwise when the lingering traces of old superstitions were still found, when the Amethyst was supposed "to make men sober and steady," the granite "to strengthen the heart and hurt the brain," the ruby "to take away idle and foolish thoughts and make man cheerful," the emerald "to strengthen the memory and stop the unruly passions," the diamond "to make him that wears it unfortunate;" when "the flesh of vipers being eaten was said to clear the sight, help the vices of the nerves and resist poison exceedingly," millipedes were said "to help the yellow jaundice," if bruised and mixed with wine, earthworms were considered "an admirable remedy for cut nerves," and oysters were believed as having the power of "drawing the venom, when applied alive to a pestilential swelling. It required a long time utterly to remove these lingering relics of an ignorant past, and to make way for the period when all should do, even as he who believed in all these fancied articles of the Materia Medica, and yet could preface his Dispensatory with the remark that "he consulted with his two brothers, *Dr. Reason* and Dr. Experience, and took a voyage to visit his mother *Nature*, by whose advice, together with the help of Dr. Diligence, he obtained his desire." By close study under the guidance of such tutors, and with the aids of chemistry, these fanciful properties of medicine were rejected and nothing retained that was not tried and approved by science.

The proper studies of the Pharmaceutist,—that is those which shall enable him to prosecute his calling with intelligence and certainty—are comprehended in the colleges of Pharmacy under three heads, Chemistry, Materia Medica, and Practical Pharmacy. The so-called science of Materia Medica embraces everything relating to the physical properties and therapeutic virtues of all those substances which are capable of producing a beneficial effect on the diseased body, and of removing injurious principles that may work detriment to the organism. Chemistry then steps in and claims the Pharmaceutist's notice, because it teaches him the properties of all these substances when they are brought into combination with each other, and whether the results of such combination shall be inert or of increased power. Finally practical Pharmacy shows how all this knowledge can be made available in the preparation of medicines for most efficacious administration. This constitutes the narrowest possible curriculum of studies that can be allowed him who devotes himself to the profession of Pharmacy,—should he feel disposed to investigate more fully the secrets of his calling, the whole domain of Natural Science is connected in some way or other with these three branches. Mineralogy and Geology, Entomology, Conchology, and Zoology in general will furnish him facts and information that can be of general use,—while Botany is almost indispensable as a guide to the recognition of the plants which experience has taught his predecessors and companions are invaluable for medicinal purposes. Thus the study of the sciences, which illustrate the three kingdoms of nature, makes him a master over their therapeutic properties, and he can with certainty procure from them all such as will be required by the physician. His knowledge need not, *should not* cease with those studies we have mentioned as absolutely necessary to fit him for the prosecution of his calling. In fact they only show him how he can walk along in the beaten track which has been laid out and planned by his predecessors. With them alone he will only be able to avoid doing wrong,—to avoid committing gross and perhaps fatal errors. But if he designs the attainment of a scientific position among his confrères, he must become himself an investigator, and endeavor to find out new plans to attain old results, or new results from the application of old laws. The day is past, we hope, when the Apothecary can rest satisfied with being a mere dispenser of articles, of whose therapeutic properties he knows nothing, and which he only recognizes by their *physical* properties. His position as a scientific man should incline him to look more deeply and thoroughly into the nature of the substances with which he is thrown into daily contact.

Some one may object here that the kind of knowledge hinted at, will make him stride after the physician's office, and instead of being satisfied with his position as a preparer and dispenser of medicine, he will aim also at the office of prescription. Now we think that such will never be the result with a pharmaceutist, whose knowledge is wide and comprehensive. The very extension of any one's knowledge on a particular subject makes him modest as to his acquaintance with all others. He has learned how much time and care and labor is required to perfect one in a particular subject, and is hence disposed to prefer the results of others' labors in their own specialities, to the slight knowledge which *he* may have of them. It is not the highly educated and well-trained pharmaceutist who avails himself of every opportunity that offers, in order to exhibit his knowledge of therapeutics by prescribing for the sick. No ! where little knowledge exists of the proper subjects of his calling, we will find more arrogance as to the vastness of the mental capabilities and more presumption as to the necessity for their use. But when we find a conscientious appreciation of the difference in the two callings, and a comprehensive knowledge of his own, there we shall find one who avoids trenching upon subjects which do not belong to his own province and which interfere manifestly with the rights of the physician. The third article of the Code of Ethics, adopted by the Maryland College of Pharmacy, shows how thoroughly its members recognize the difference between the two callings, and how careful they are in drawing the lines which divide them. This article reads as follows : "As the diagnosis and treatment of disease belong to the province of a distinct profession, and as a pharmaceutical education does not qualify the graduate for these responsible offices, we should, where it is practicable, refer applicants for medical aid to a regular physician. The oft repeated assertion that many persons are not pecuniarily able to employ a physician, may be met with the fact that there are several excellent and well-managed Dispensaries where medical attendance and medicines are furnished gratuitously." Such doctrine we should expect from the enlightened mind which has been devoted to any branch of study. It is the quality of knowledge not to vaunt its own merits, or to usurp the place of others.

In an enterprise like the establishment of a College of Pharmacy the physician has nothing to lose and everything to gain. His prescriptions will be prepared by a scientific man, whose education and daily practice especially fit him for the duty ; while he will have one on whom he can rely for the preparation of new chemical compounds to meet new therapeutic indications with certainty and success. The apothecary is then no longer a mere vender of herbs with miraculous healing powers, of minerals whose properties were asserted to be of the most contradictory and ridiculous character, or of animal products, whose disgusting nature forbids us almost to entertain the thought that they were ever employed for medicinal purposes,—he is now the aid and assistant,—the good Samaritan who offers the oil and wine when the physician may think the exhausted energies of the sick demand remedial applications.

But may not all the knowledge we have referred to as necessary to the Apothecary, be obtained by reading in the shop, by carefully examining, in an experimental way, into the properties and uses of his drugs, and by practically employing himself in the details of Pharmacy? This question would however serve as an objection against any and all education whatever, except that which a man acquires by his own unaided efforts. It is one, to which we dare not give a direct, categorical answer ; since a negative would not be truthful in some particular instances, and an affirmative would imply just as much error. We dare not, I repeat it, say that all this *might* not be accomplished, and has not been accomplished by some, whose perseverance and indomitable will, enabled them to conquer the difficulties which attend a private course of study. They have been enabled to gain a thorough and satisfactory knowledge, by dint of labor that few are equal to. The object of all teaching is to pave the way for the easiest possible acquisition of knowledge,—to furnish such guide-posts and finger boards along the road that the student shall not go astray, and wander in dark and obscure thickets by the wayside, but shall find that his easiest path is that which science illuminates with her own bright rays,—to free his mental vision from all error. It is not intended that the student shall be freed from all labor. For, there is no means of accomplishing mental labor, by appliances similar to those which the mechanic can contrive with the aid of steam or electricity. There is no royal road to learning ; no rail-train up the Hill of Science. With all our ability to conquer high grades, yet such a steep is only to be ascended by the slow-toiling foot traveller. If he starts without a guide, he may get himself involved in the intricacies of the bushy undergrowth which surrounds its base ; allured by the leaping mountain stream, his footsteps may be checked by the marshy ground that it has formed in the little hollow through which it passes ; attracted by some inviting path he may find himself, after days of labor, at the point from which he started, having encircled the base instead of ascending the hill. But with untiring perseverance he may overcome all difficulties and reach a commanding height. The number of those however is few in all professions and callings, who have without aid and assistance, accomplished such a glorious result. We are proud to refer to them when we speak of what has been done by those who have pursued knowledge under difficulties. For the majority of mankind, however, guides must be procured who shall show where the best paths for the ascent are to be found, and who shall train the minds and judgments until they have acquired strength enough to grapple with difficulties without external aid, and ability to decide for themselves, which is the best path. The teacher occupies the peculiar prerogative of communicating to the taught, that which has been made familiar to his own mind by dint of special devotion to any subject, and thus preventing the consumption of strength and energy on that which may not require any such outlay. When the mind has become habituated to the work, like the tree which has grown stout and strong, it no longer requires props to support it, but, rejoicing in its own strength, encounters the storm with impunity.

Again, with private study there is a want of that system which ensures the most speedy success, and the most reliable results. The instructions of the college communicate system to the student's labors. He has presented to him by those who are conversant with the particular topic, in connected form, the laws which underlie its study, the facts which prove those laws and from which they have been deduced, and also the mode of investigation, by which other deductions may be made and other reliable facts accumulated.

Now to apply these ideas to the College of Pharmacy. The Materia Medica are presented to the student's mind in their relations to each other, and to the peculiar symptoms for which they are adapted. The striking points in the history of each are brought before him in a way that claims his attention. The eye is not only impressed with these, but the ear at the same time, and thus the two senses are brought to act contemporaneously in the study. In chemistry, the results of others' labors as well as those of him who lectures, are brought before the student, experiment demonstrates the truth of the principles laid down in the text-book, and the science becomes a living, actual fact instead of a mere sequence of dry detail. The same is true of practical Pharmacy. While the regular work of the shop would in course of time familiarize the apprentice with nearly all the processes of this art, yet the rationale underlying these, and their connection with each other would hardly be appreciated.

We can then sum up the utility of the college as consisting in the presentation of the surest and swiftest method of gaining a knowledge of Pharmacy, in clothing this knowledge in an attractive form,—bringing out the most important points for the student's notice,—and in giving him a connected view of the relations of the whole subject, which require his attention. If the instructors in such an institution are enthusiastic in their vocation, honest and true to their duties, all these ends will be obtained. But besides these, who does not know the value of system in study, and of the assignment of a certain hour to certain duties ; and still more the importance of bringing those together who are prosecuting similar investigations, and causing mind to brighten by collision with fellow mind ? This itself is of no small benefit. The youth feels the stimulus of laudable ambition, and enters with a generous and honorable rivalry into the field with his brethren. He lags not by the wayside, for he does not want to be recognized as inferior in abilities and diligence to his companions. Thus mutual emulation acts as the spur to the indolent, and a noble impulse to the industrious. If engaged in private study in the shop, he may easily be persuaded to relinquish his task for some other attraction, and no one will readily detect his negligence ; but if this is done here, the contrast is seen at once and odium rests upon him for it,—not only for the present but odium of that character which requires years utterly to irradicate.

In considering the utility of Colleges of Pharmacy, the subject naturally divides itself into three parts, relating to the different classes in the community interested in the matter. Let us then dwell for a short time upon each one of these divisions, and see how such establishments can be useful and protective to the Apothecary, the Medical Profession, and the community at large.

I. We have glanced at the necessity of instruction, other than that acquired by means of private study ; now we give as one of the main reasons for the establishment of colleges, the fact that the Apothecary himself cannot, for want of time, communicate to his apprentices the varied information which is required of them for the proper prosecution of their calling. He is aided greatly by the instruction his apprentices receive in the lecture room. His own time, unoccupied by the duties of the shop can be devoted to private researches which will redound to the increase of the general stock of knowledge. A spirit of earnest desire is promoted on the part of the apprentice, to thoroughly understand a subject, so that he can not only be an efficient aid to his employer, but may eventually become a *Master in Pharmacy* himself. He rises above the position of a mere machine for mortar and pestle work, for trituration and decoction-manufactures, for unguent and plaster spreading, to that of an intelligent and reliable vender and dispenser of medicines. Neatness and cleanliness in his work, required particularly in this business, are cultivated by one who hears them systematically enjoined upon him in the repeated instructions of his Professors. There is need for their existence as he finds himself thrown into daily contact with his fellow-apprentices, and appreciates the fact that in the future contest for success, the world will favor him that seems most deserving.

The Apothecary is not tied down to his counter, when his apprentices begin to obtain a knowledge of the business, at once theoretical and practical. He has intelligent aids and feels no reluctance in leaving in their hands his reputation as a pharmaceutist, which is in fact done when he confides the preparation of his patron's prescriptions to their care. He is in the position of being able to communicate freely with his brethren at meetings, held from year to year, at different points of the country, and there by an interchange of views contribute to the advancement of the general fund of knowledge. He knows, in leaving home, his business is left with prudent and intelligent hands, and that no detriment will ensure. The complaint of the members of the American Pharmaceutical Association from country-towns, that they are often unable to attend its meetings, on account of the uninstructed clerks to whom they would be obliged to confide their business during their absence, presents strongly the necessity of a strict and systematic course of study for said clerks. The Apothecary feels, without an intelligent corps of assistants, that his absence can never result in anything but detriment to the establishment, and hence he is prevented from knowing what is going on outside of his little home circle, and availing himself of the aid and assistance, which would be conferred by it.

Again, the relation of employer and apprentice becomes more intimate and confidential, as the latter shows an increasing store of knowledge. The inducement to impart information is naturally greater, when the recipient is giving proof of his appropriation of what has been communicated before, than when the uncultivated mind is ignorant of the uses of such information. Hence as the apprentice returns from the lecture-room to his place behind the counter, he feels not only that he has gained some fact not known before, but that the things of which he is ignorant, are numerous and extensive enough to employ his whole life, and he is more willing to receive instruction from the employer than ever. His reading loses that desultory and trifling character which marks the early years of most men's lives. It becomes professional, and has some relations to the varied branches of science. The trifling and ephemeral literature of the day, does not hold out the attractions it did before he caught a glimpse of the brighter and more permanent beauties which science presents ; and now if he is disposed to venture into the department of Belles Lettres, a more judicious selection of authors ensures him some real, substantial return for the time so occupied. But he finds that the history, nay even the poetry of science has the most attractive charms. Here he can combine the beautiful with the useful, and while laying up stores of knowledge that will come into daily use, he may gather flowers whose beautiful colors and fragrant odors shall please the eye and charm the soul of man. He becomes the better Apothecary, and the better citizen, for *every* man who has qualified himself with care in his peculiar calling, becomes an honor to the community, and of priceless value as a citizen.

And the well instructed apprentice, having closed his pupilage, and having commenced business for himself, will see from his own past experience how necessary it is that his own employés should have the same advantages and undergo the same character of training to which he was subjected. Thus generation after generation of men are fitted and trained for the profession, and its own dignity and importance increases with the increase of knowledge among its members. This is the case with all callings ; we learn to respect them more as the dissemination of knowledge among their members produces an elevation of their position. An art always becomes more dignified when we find its cultivators understand the science which underlies it.

Another advantage of Colleges of Pharmacy is in the fact that they eventually become depots for the storing away of new contributions to knowledge, from which the profession itself can afterwards draw with greater confidence than from any other available source, what has been done by its distant members. Journals occasionally give outlines of processes specious *in fact*,—may detail discoveries that are fallacious, as well as describe the new truths that have been garnered in by the patient and intelligent laborer. This is almost unavoidable. Their editors cannot always experimentally test the statements contained in the columns of other journals, nor even those of their own contributors. Hence this mode of diffusing information, so invaluable in many points of view, is liable to some objections, and cannot be compared with that, where the speaker not only announces the fact but experimentally demonstrates it, and satisfies the spectator both as to the result and the mode of operating to obtain it. The particular attention which is paid each to its *specialite* would lead us naturally to expect a more perfect acquaintance with its progress from the Professor than from those who are more specific in their private studies. The constant frauds carried on in the drug trade must be here investigated, and whatever sure and reliable means can be adopted for their detection should here be explained in the clearest possible manner. This point alone has become so important that a separate chair in the college might find its time entirely occupied with the adulterations of drugs, as practised by unprincipled, ingenious foreigners and Americans. Fraud has crept in and most wickedly has adulterated those articles which are to be relied on as safeguards from disease. Without the aid of scientific advice the apothecary is unfitted to judge of its effects. Science has been brought to bear in the manufacture of the fraud, and without the aid of the former the latter cannot be detected. This one point alone would require a more intimate acquaintance with the principles of science, in order to keep pace at least with the detection of the rascality of the times. Physical properties no longer serve as true tests of the purity of a drug, because the taste, the color, and the feel of the object may be perfectly imitated. We must go deeper into its examination to procure certain results. It may seem unnecessary to dwell upon the importance of this point, as those familiar with the subject will at once recur to countless forms of adulteration that have been invented during the past few years,—how quinia has been adulterated with starch, sugar, gum, sulphate of lime, mannite, stearine, margarin, salicin, cinchonia, and a score of other articles, more or less inert and all inferior in specific properties to those of the pure alkaloid. The process of adulterations has invaded even our common articles of food and drink, and ingenuity has been taxed to bring large profits into the manufacturer's pockets, while the purchaser foolishly imagines he is procuring a very cheap and reliable article. The series of adulterations found in the coffee sold to our brethren of the British isles will make the extent of this recognizable to every one. We are told,* that "the coffee dealer adulterates his coffee with chicory to increase his profits—the chicory-maker adulterates his chicory with Venetian red, to please the eye of the coffee dealer ; and lastly, the Venetian red manufacturer grinds up his color with brick-dust, that by its greater cheapness, and the variety of shades he offers, he may secure the patronage of the traders in chicory."

The science required for the detection of pure drugs, it will thus be observed, is associated intimately with that required for the detection of adulterations, and this can be best obtained from those, as we have said, who have devoted their talents and energies to the study, and who, by constant and repeated practice, have acquired facility in communicating their knowledge.

One other argument on this point and we shall leave it. The instruction of the college is superior to that of the shop, because it occurs under circumstances when the mind of the student is not liable at any moment to be distracted from the subjects under consideration. While in the shop, however much may be the patronage it enjoys, there will be, it is true, many hours of leisure which can be devoted to study, but there is always the liability of being called away just at the time when the investigation becomes most interesting. The mind cannot be so exclusively directed to the subject. But while in the college, the feeling that the hour has been set apart for a certain work, and that there is no probability of any intrusion, enables the student to devote his whole mental energies to the subject,—to take in everything relating to it. There is nothing to distract attention, and everything to induce it ; his fellow students bent upon the comprehension of the subject, the preparations on the lecture table, the animated words of the speaker,—all these invite him to receive and master the principles of his calling.

II. But the establishment of Colleges of Pharmacy are of invaluable benefit to the Medical Profession. Now, no two classes of men are more intimately connected than Physicians and Pharmaceutists,—more absolutely dependent upon each other, according to the division of duties which the progress of knowledge has determined to be necessary. In olden times, the two were combined in one person. Knowledge of the branches peculiar to both was by no means extensive enough to require a separation. The leech could compound the medicines that his studies had revealed to him, with as much certainty as the science of the times could furnish. But what was *that* science? Let us recollect this was in those days when all surgery was practiced by barbers, and that *it* was considered by no means as the most respectable of the barber's various employments. Let us recollect that this was at the time when the medical man required all possible mystery in order to keep the people from knowing his treatment, and to excite, as much as possible, faith in him and his remedies. But when his knowledge increased, it became evident that the preparation of medicines was an occupation of sufficient magnitude and importance to require the undivided attention of one person. The physician resigned this portion of his old duties, which had become rather irksome, since his attention was required by other branches of more immediate interest professionally; and, unless in country towns and villages, where circumstances prevent the separation of the prescription from the preparation of remedies, the two are kept absolutely distinct.

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* Johnson's Chem. of Common Life, I. 218.

Who can have more interest in the thorough education of the apothecary than the physician? Is not his reputation concerned in the result of every prescription he makes, and which he confidingly sends to the shop for preparation? His adjunct in the proper management of disease is the apothecary; all his prescriptions are based upon the perfect fitness of the latter. The combination that he adroitly throws together, of substances, whose therapeutic properties his experience tells him are likely to produce the desired effect, is worthless, and it may be worse, unless the prescription shall be rightly interpreted and properly prepared. Is not, then, the education of the Pharmaceutist a matter of vital importance to the physician? The latter labors, from his first entrance into his preceptor's office, to acquaint himself with the structure of the human frame,—toils over the dissection table until its recondite mysteries are clearly revealed; scrutinizes carefully the functions of respiration and circulation, of digestion, assimilation, and excretion; examines the development of the mystery of life from its starting point, the wonderful organic cell up to its full completion—the adult man; studies how he may bring relief after injuries which produce results requiring surgical skill and the aid of the knife; investigates the mysterious action of remedies upon abnormal actions and morbid substances in the human frame; constrains all branches of science to pay their homage to the court of Æsculapius, and with generous rivalry to pour out, from Cornucopiæ of treasures, rich and priceless gems for the aid of suffering humanity, too well satisfied if they can only be found available in the philanthropic exercise of the physician's art; devotes time, and talent, and assiduous labor to the investigation of disease and the alleviation of its most pressing and urgent wants,—finds nothing too much for him to give in order to compass the duties which devolve upon him, as a High Priest of Nature's inmost sanctuary. And all this, with inadequate returns, both pecuniarily and otherwise, for his mental and bodily labor, and sometimes met with contumely and reproach, because he cannot accomplish that which is impossible to fallible beings, and only within the reach of Omnipotence itself. I hesitate not thus to speak of the energy and self-sacrificing spirit of the medical profession,—and in this way to bear my own small tribute of respect and grateful admiration. Let them be honored by their fellow men with the rewards, which a due appreciation of their merits will demand!

With all the vast fund of knowledge possessed by the physician, he is still dependant upon the pharmaceutist for the completion of his arrangements in the treatment of disease. The latter is his constant and necessary associate,—the instrument for carrying out most of his conclusions and orders with reference to the sick. If the physician requires years of study to fit him for the treatment of disease, surely he requires that the dispensing apothecary should have a proper training as to the preparation of his prescriptions. His confidence in medicines will be of little worth, unless he can be assured that they will be furnished of a pure and unadulterated character, and compounded with accurate scientific skill. How often have not his most sanguine expectations been frustrated by the administration of a weak and adulterated article, instead of one of the proper strength and purity as contemplated in his prescription? The most serious results have also occurred from the ignorant mistakes of those who were unfitted for their business, and who have substituted some powerful alkaloid for a simple medicament prescribed. Where absolute dependance is so necessary, as in the relation of the physician and the apothecary, there should be no cause at all for the slightest ground of fear that *that* might be misplaced. Every thing demands the most thorough ability to represent the physician's order,—the sleepless eyes of the mother as she hangs over the couch of her beloved, — anxious and excellent friends watching the crisis of disease,—sorrowing children hanging with all love and tenderness around a patient's bed,—the shriek of pain and the wail of affliction,—all demand it. Suffering humanity, that has placed itself under the care of the medical man and with an abiding confidence is awaiting the result of his thought and his advice, demands it. Nature herself, who has supplied alleviating cordials and healing balms, demands it. All that has to do with the secret emotions of man, with his hours of affliction and suffering, with his relations to nature and his fellow man, requires that the apothecary should be "*an intelligent adjunct to the physician in combatting disease.*"

Now as we have shown that proper preparation can best be obtained in the College of Pharmacy, we trust that the point is proven, of how great an utility these institutions are to the regular practising physician. We can well understand the sound judgment which dictated such language as the following in " the Address to Druggists and Apothecaries," adopted by the American Pharmaceutical Association, that the apothecary "should cultivate a good feeling toward the medical practitioners of his neighborhood, should study the interest of the latter, so far as the efficiency of medicines is concerned, and physicians will soon, from interest, incline toward him." We may add a still more powerful motive for such patronage on the part of the physician, and say that from *necessity* it would be conferred. The reliable apothecary is an invaluable treasure to the physician, and he will, by a natural course of things, find him out. It is as a shield and protection against deplorable ignorance and bungling inexperience that he will patronize him, and throw the weight of his influence for the support and maintenance of his shop. The ammunition required in his continuous warfare with disease must be supplied from an arsenal, where all is kept in efficient, working order.

Is it too much, then, to ask that medical men should acknowledge their anxiety to have a host of scientific apothecaries—a band of reliable dispensers of medicine—by lending the countenance of their influence to every attempt, well-conceived and judiciously-planned, for the foundation of a College of Pharmacy? It is as necessary that the most convenient and available means be adopted for the proper education of the pharmaceutist, as it is that every effort should be used to increase those for the training of the physician, at least so long as prescribing and dispensing shall be the duties of two different persons. We claim that the physician should give every aid and encouragement to such changes; and that he should discountenance all those who have disdained to employ the advantages of these colleges, where such have been placed at their disposal, full as much as he would hesitate to consult with one who had not passed through a medical college in the preparation of his preliminary education. This, of course, applies to cases where collegiate advantages have been within reach of the pharmaceutist. Where this has not been the case, the physician will always discriminate between him who has fitted himself by the advantages within his grasp, and one who has neglected so to do.

III. Lastly, we wish to dwell for a few moments on the utility of Colleges of Pharmacy to the community at large,—or rather, on the importance of having educated pharmaceutists to dispense the prescriptions which the attending physician has ordered. It is not only the matter of reputation with these, as with the pharmaceutist and the physician, which makes it desirable that a high character of education should be established for the dispenser of drugs. Life is often concerned. A mistake is not only an indication of ignorance on the part of the apothecary, but it may be death to the patient. The possibility of such an event as the fatal termination of a case, where a wrong drug has been substituted for the proper one, may not only exist, but quite a number of cases, illustrative of this, have occurred. The newspapers, from time to time, tell us how strychnia has been substituted for morphia, oxalic acid for sulphate of magnesia, arsenic for a number of white powders, which it may resemble in physical qualities, and other blunders of a similar kind, and how the mistake has resulted in the loss of life. We say there is no protection for the community, when implicit reliance is placed in a pharmaceutist who is ignorant of his business, and the sciences on which it is based. It is like permitting a man to walk through a cellar, where a great quantity of powder has been stored away, with a lighted candle. He may pass through, time and again, and no evil result; but the time may come when a spark shall ignite the powder, and destruction will be certain. The danger, however, of such a result, is always imminent. And the ignorant apothecary may dispense medicines for a long time, and no harm result; yet, there is a fear always to be felt, that the time may come when a sad result may attend such ignorance. We need not only expect that the people will recognize in a negative way the necessities of Colleges of Pharmacy, but rather expect to see them demanding them most positively from the profession itself. The health of friends and families depend upon it; the prescriptions of the physician are null and void without the educated ability to put them up. While they demand that their medical attendant shall know his business thoroughly, they should in all justness and fairness ask the same of his adjunct.

Then, as a protection from the injurious effects of ignorance, we do not hesitate to claim the support of the community at large to all such enterprises. As wide a difference exists between him who intelligently prosecutes the business of the pharmaceutist and the mere bungler, as between the preparations which the pharmaceutical chemistry of the present day furnishes us, and the horrible decoctions which superstition prepared centuries ago, with all imaginable terrifying rites, for the cure of disease. In the one case there is truth and certainty—in the other ignorance and stupidity.

Not only may positive injury be inflicted by the substitution of powerful drugs for weaker ones, but the opposite substitution may result fatally in cases where the immediate action of a powerful one was required. Again, reliance can only be placed in the apothecary for the purity of his stock. If inert impurities are present, which is mostly the case where adulterations are employed, then we have the second difficulty just named. In any case, the effects of both the medicine and disease are trifled with, and all because the individual dispensing them has not properly fitted himself for his business. The community is bound in self-defense to further the interests of institutions for this kind of instruction.

We have thus endeavored to show the utility of such Colleges to the three classes just mentioned. It remains for us to add a word on the propriety and necessity of establishing one in this community. The advantages of such an Institution mostly remain in the city where it is located, although its graduates by slow movements invade the country and bear with them the influences of their collegiate training. Their movements however are slow, and hence wherever the size and population of a city demand the presence of a large number of Pharmaceutists, the necessity arises for the establishment of a college where they can be properly indoctrinated in the essential elementary branches. The period of time usually passed in attendance on lectures is during the apprenticeship of the clerk, and hence the college must be brought to his door. He cannot seek it as the medical student, because his occupations forbid. His shopwork must take place at the same time with his attendance on Lectures, and this is right, since the two properly go together, and should not be separated. The apprentices of Baltimore cannot leave the city to attend Lectures in Philadelphia or any other place, where the inducements may be very great, but on the other hand, the same conveniences must be brought to their door that are possessed by these other places, so that while at home they can obtain the necessary knowledge.

With such conviction the Trustees of the Maryland College of Pharmacy have made arrangements for the establishment of suitable courses of Lectures for the education of the young pharmaceutist, and this day we thus publicly inaugurate the college. On the part of the Faculty we assure the community that every endeavor shall be made to give such instruction as will combine science with practice, the theory with its experimental illustration.

Whether this enterprise shall succeed or fail, depends on the interest those persons we have considered as especially concerned in it, shall take by way of encouraging and holding up the hands of those engaged in its prosecution. With, however, the most abiding confidence in the enthusiasm and intelligence of our citizens we thus launch our vessel on the ocean of time, with the hope that prosperous breezes and all good omens may attend its way through future years.

THE

MARVELLOUS

IN

Modern Times,

BY

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Society for the History of the Germans, in Maryland

Histoire du Merveilleux dans les Temps Modernes, par Louis Figuier. Tome premier (Les Diables de Loudun, Les Convulsionaires Jansenistes),—Tome deuxieme (La Baguette divinatoire, Les Prophetes protestants).

We are not of those who reject every marvel simply because it seems to have occurred in direct contravention of the laws of nature. There is really an extreme of incredulity as well as of credulity in the world,—one manifested by those who reject every thing they cannot understand, and the other by those who hail with delight all that is mysterious and obscure, reject the proper modes of testing its claims on our belief, and live a life of servile dependence on the creations of their own or their neighbor's fancies. There is a singular fact, connected with these extremes, illustrating the old proverb "that extremes meet,"—a spirit of irreligion, or rather a want of true religious faith, seems to pervade both the extremely credulous and the willfully incredulous. Thus we find these two classes rarely properly represented among humble, faithful, God-fearing Christians. These are willing to recognize the wonders of an Almighty hand in the pages of history, whether blood-stained by the records of battles or adorned with the triumphs of inventive peace,—those dispute the existence of every thing that is not plainly the result of known physical laws: or these reject all demonstrations of natural phenomena which are claimed to be produced by spiritual means as lying wonders calculated to bewilder the mind and lead the soul from the wholesome ways of truth,—while those, too proud to be humble Christians, and anxious for some new revelation, hail all the miserable tricks of charlatans as so many indications of spiritual communication and interference, and allow themselves to be blinded by their conceit until all the security, afforded by the sheet-anchors of reason and faith, being lost, they drift out into the illimitable ocean of ignorance and superstition.

The Christian does not feel himself obliged to believe every thing his senses report to his brain, if such reports involve a contradiction of the laws of nature, and are manifestly not intended to communicate any great fact or wondrous message from the Creator; and, on the other hand, he does not feel called upon to explain the cause—the trickery it may be—of the mysterious phenomenon. Where pretended revelations from the spiritual world attack the truth of Holy Scripture, the teachings of the Church, and the experience of the saints of all ages, it is a matter of small importance, whether the Devil and his wicked spirits be considered *mediately* or *immediately* concerned. It is not worth the time consumed in the discussion, to determine whether the powers of the lower world have acted upon the hearts of men so as to make them conscious deceivers of their fellow men. The main point for the Christian to keep in view, in these cases, is, that, whatever attacks directly a part of his Christian faith, must be thrust aside as dangerous and even deadly in its tendency. If he do this, he may be called illiberal, unprogressive and superstitious, but he will keep in the true path and will be justly entitled to none of these stigmas.

On the other hand, it is not unchristian to believe in "the continuance of apostolic gifts." Dr. Bushnell has well aid,* on this subject, "there are yet, in every age, great numbers of godly souls, and especially in the lower ranges of life, to whom the conventionalities of opinion are nothing, and the walk with God every thing, who dare to claim an open state with Him; to pray with the same expectation, and to speak of faith in the same manner, as if they had lived in the apostolic times. And they are not the noisy, violent class, who delight in the bodily exercises that profit little, mistaking the fumes of passion for the revelations of God, but they are, for the most part, such as walk in silence, and dwell in the shades of obscurity."

Via media is always the most difficult path to discover, but it is the safest, nay the only safe path for the traveller. No labor, or care, is too great which may lead to its discovery. We must steer clear from those who solely believe in the every day natural phenomena of life, as well as those who delight in the glitter of novelties. Both will have a host of followers. Mankind is not only prone to disbelief, but also paradoxical as it may seem, to adopt novelties.

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*Nature and Supernatural, 490.

> "Whate'er absurdity the brains
> May hatch, yet it ne'er wants wet-nurses to suckle it:
> Or dry ones, like a hen, to take the pains
> To lead the nudity abroad, and chuckle it;
> No whim so stupid but some fool will buckle it
> To jingle bell-like on his empty head;
> No mental mud—but some will knead and knuckle it,
> And fancy they are making fancy bread."

The History of the Marvellous in Modern Times is fraught with interest to the student. It shows how prone man is to run after novelties, to desert old paths, and how epidemic the belief in wonders may be at certain periods in the world's history. Whole countries have been over run with strange delusions seizing the wisest as well as the most ignorant, and fanaticism, laughing reason to scorn, has reigned triumphant over all. To collect clear and impartial accounts of some of these in modern times has been the self-consigned task of the sprightly Figuier, and two volumes have already appeared as the half of his contribution to the literature of this subject. He promises additional volumes on *Animal Magnetism*, *Table-rappings* and quasi-*Spiritual communications*. We doubt whether the world is yet prepared to discuss these, but when his volumes appear, if other engagements do not claim our pen, we hope to make them subjects of other papers for the consideration of the readers of the Review. For the present, we purpose noticing the two volumes, which have already appeared, full of much that is interesting, novel and instructive to those who will tear off the covering to read the concealed moral. The past is pregnant with that which may be made instructive to the present, if we will but labor to understand it.

Figuier, looking upon the pretended marvellous manifestations of the present as the necessary and almost inevitable development of similar phenomena in past ages, is somewhat skeptical, but his facts are always reliable. He considers that " the marvellous is food so necessary to the human mind, that, among all people and in all ages, there has existed a belief in extraordinary things and an admission of the existence of supernal facts. The harmony of the phenomena of the world, the order of nature and the constant regularity with which its laws are exhibited, can not satisfy this passion for wonder." The priests of India,—the brahmins of the first rank—proceeding from the brain of Brahma, were supposed to be the proper *media* for the communications of man with the divinity. Zoroaster formed the spiritual and material world out of an universal fluid, which was the actual substance of divinity. From this, it was an easy matter, to form minor deities and to create prodigies. The Pythoness, seated on the tripod, inhaling exhalations from the earth, fell into convulsions and uttered words which were interpreted by her attendants as prophetic communications. The pages of classic history are full of wonders of this kind, showing that the Greeks and Romans were ever ready to believe in something higher and more powerful than the merely human. As we approach the Christian Era the curious legend of Epithases meets our eyes; while becalmed near the isles of the Ægean Sea, a mysterious voice calls on Thamas, the pilot, and orders him to cry out with a loud voice, when the vessel should arrive at a certain position, that *great Pan was dead.* Thamas having obeyed this order, the air was filled with groanings and lamentations. Whether this is entitled to credence, or is merely a poetic mode of expressing the opening of the period when the overthrow of paganism was to be accomplished, and the reign of true miracles was to be established,—it is foreign from our design to discuss now.

Shortly after the beginning of the Christian Era, prodigies are attributed to the wonderful supernatural power of magicians and soothsayers, which far exceed those said to have been produced in the more distinctly pagan days of Roman history. Simon of Samaria was thought, by the enemies of the Christians, to be the special envoy of the ancient divinities with full authority to demonstrate their powers and might,—by the Christians he was considered as being favored by demoniacal aid. All his acts, seen through the dim corridors of the past, assume a miraculous character. He is said to have created statues that moved boldly before wondering crowds, and to have remained sound and uninjured amid the flames of a funeral pile. Contemporaneous with this juggler, was Apollonius of Thyanes, who lived to the age of one hundred and thirty years. He possessed the power of transporting himself at will from one place to another, of converting himself into various objects like the fabled Proteus, and of evoking "spirits from the vasty deep." At Ephesus, when the plague was depopulating the city, he attributed the cause to an evil spirit they were harboring within the walls. An old beggar was seized upon as this evil spirit. Being stoned to death, instead of the body of a man a carcass of a dog was found, which being interred the plague ceased. In these days sorcerers and magicians became so numerous that "the poets complain of them as a scourge, and edicts of expulsion were issued on several occasions by the emperors." Tacitus relates that the opportunity was also employed to rid the city, at the same time, of the philosophers.

They were followed by men who worked in accordance with their formulae, but without a tithe of their talents or skill. The very edicts of banishment gained them partisans. Mankind is always disposed to array itself on the side of the apparently persecuted. Christian rites and ceremonies, not understood, were mingled with pagan ceremonies, and a mongrel magical art was the result which increased with the lapse of time, till saints, angels and archangels were invoked to aid in the most questionable investigations and pursuits. The psalms were employed as an important part of the ritual of the magicians. The disease gained its height in the middle ages, and we turn over the pages, written by its followers, with an astonishment that knows not whether to express itself in smiles or tears. A collection of forty chief treatises, on Magic and allied subjects, written in the middle ages and published under the title of *Schätze aus Kloster-Bibliotheken*, has come into our possession, and we think it incomparably the greatest farrago of nonsense we have ever met. Hebrew, Chaldaic and meaningless words are strung together, like beads on a string,—and supposed, when cited in due order, to be all powerful in bringing forth familiar spirits.*

But we cannot follow the history of magic with any closeness,—the whims, conceits, follies and supposed demoniac possessions of ages nearer the present demand our attention. Demoniacal possession being a fact in the early portion of the Christian era, when the period of division and schism had arrived, this charge proved a powerful weapon in the fratricidal wars that were constantly taking place. The Church distinguished between those who had voluntarily signed the contract with the Evil One, and those who were affected through the vile arts of sorcery. It was supposed there were those, like Faust, who would peril their soul's salvation for the power of commanding the powers of the earth, air and sea. These were subjected to death in all the forms that an ingenious cruelty could command. The Church had a special rite for exor-

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*A spirit is thus invoked, who was supposed to have charge of hidden treasure: Audi, audi spiritus obstinax, qui Thesaurum sub hac terra, unde ista portio desumpta est, latentem custodis, aut possides. Adonay, Sabbaoth, Cadas, adonay, ammara, alli, adoy, Sabbaoth, ammara, collniziara, offina, altennedera, fuffa, Menfent, Bengraf, hamasixin, ula, ula, coraf. Jasuren, omasixel, sehani, eissoas, leroas, Hasiedin, ha siedin omdin, lafonaff, Kaslah, laugna, bosuras, chaphirh, chaphirach, hami, Kopa, heogunh, Scheuschen, togas, togos, hage, Phanim, debugim, menaihuh, menaihuch, Schegamhim, &c., &c., &., &c. Veni, compare, et affer statim Thesaurum petitum modo libi, tuisque praescripto hic loci, et satisfac petitioni meae in omnibus ad amussim ocyus. Letamnim, letaglogo, letasynin, tebaganaritin, letarminim, letagelogin, letafalosin, Amen. Will the reader only think of 718 pages *done up* in that style!

Schätze aus Kloster-bibliotheken, 548.

cising a demon who had become incarnate in the body of a man. After mass, the person, having previously fasted, the demon was ordered to make a certain sign in the name of Christ. If this was made, the fact of possession was established, and the rites of exorcism were proceeded with.

In 1436, in the environs of Berne and Lausanne, a class of men arose who devoured human flesh, even eating their own children, pretending that these foul deeds were done in accordance with the command of Satan. Hundreds of individuals, suspected of these crimes were exposed to torture and acknowledged them.* In 1459 the mania of sorcery seized Artois, and those apprehended by the ecclesiastical authorities admitted attendance on nocturnal meetings, where the filthiest orgies were performed. In 1484, Innocent VIII. issued a bull against those who practiced the arts of sorcery in the regions of Cologne, Mayence, Treves and Salzburg. Among those arrested in this region many confessed the crime of anthropophagy, being impelled thereto by "*un instinct diabolique.*" One *sage-femme*, who was burned at Dann, in the diocese of Basle, confessed that she had destroyed more than forty infants. It is a question whether any of the accused were *really* guilty of anthropophagy, or had merely pretended the performance of the act, under the influence of an epidemic mania.

In the Sixteenth century, the juridical horrors were the same as in the Fifteenth. Over thirty thousand victims were made to suffer for the crime of heresy in the reign of Philip II. of Spain, and many were burned alive at Calahorra, being accused of sorcery. In Italy appeared the *Stryges*, sorceresses, who claimed that, by mentally invoking the power of a demon and by virtue of some sacramental words, they could transform themselves into cats. In the shape of the latter they pretended that they could enter, through windows and other openings, rooms where infants were exposed, and then extract their blood through punctures made for the purpose. In 1521, Zoanthropia assumed another form in the mountains of the Jura. It was pretended that men assumed the form of wolves, and devoured women and little children. Three men, Pierre Burgot, Michel Verdung and Philibert Montôt, charged with being were-wolves (*loups-garous*), were burned alive, and their portraits were suspended in the church at Poligny. In 1522, the convents of Holland, Germany and Italy became objects of attraction from the singular forms which hysteria assumed in the nuns. Exorcisms were resorted to, and where these would not quiet the nervous irregularities, severer penalties were adopted. From many of the symptoms reported we can have no difficulty in guessing at the cause of the hysteria, but medical disquisitions are prohibited in the pages of the Review.

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* J'ai appartenu, disait l'un d' eux, ainsi que ma femme, à la corporation des sorciers ; j'ai renoncé aux grâces du baptême, à la foi chrétienne, à l'adoration du Christ. J'ai pris l'engagement de fléchir le genou devant le maître de l'enfer ; j'ai bu du suc extrait de la chair d'enfant, suc que les adorateurs de Satan conservent précieusement dans des outres ; ce breuvage procure un savoir qui n'appartient qu'aux initiés.

Hist. du Marv. I. 39.

The mother of the great Kepler was charged with the practice of magic and barely escaped being burned alive. Her son deemed it his duty to protect his mother from the charge, although he did not deny the reality and power of sorcery. Indeed the seventeenth century abounded in instances of men and women, who were subjected to severe tortures, and even death, on account of complicity with the powers of the lower regions. Fire was the catholicon supposed to be alone efficient in such dire cases, and its purifying agency was invoked in the most absolute way imaginable.

Figuier gives, at full length, an account of the *demonmania* which prevailed, about the year 1632, in an Ursuline Convent, composed of the daughters of the nobility and established at Loudun, a little village in the diocese of Poitiers. At first, the nuns were said to leave their beds at nights, and to crawl over the roofs as somnambulists, thence descending to the chambers of the boarders. Complaint was made that they were beset by spectres at night, and that blows had been received, the marks of which remained. The priest, attached to the establishment, Mignon, concluded that the symptoms justified the idea of *possession diabolique*. The advice of a neighboring priest, who was continually employed in hunting out demoniacs, being obtained, he began to exorcise the superior and two of the nuns. The condition of affairs in the convent was soon made public, and the two zealous priests deemed it proper to report to the Judge and Civil Lieutenant of the village. As soon as they reached the convent, they were informed by Barré, the Exorcist, that he had driven the demons out of the Superior and one of the Sisters, and that one was named *Astaroth*, and the other *Sabulon*. It seems, however, that the exorcism wasn't very efficient, as the Superior was seized with convulsions at this visit. The sorcerer, charged with the foul work, was Urbain Grandier, a priest. The demon was publicly interrogated in Latin, and answers were returned in the same tongue*,—but when the demon, possessing a lay sister (who did not understand Latin), was interrogated no answer could be obtained. The Civil Lieutenant wished to know whether the possessed had any difficulty with Grandier, but the priest would not allow, what he called, "indiscreet questions."

On investigation, after leaving the convent, the civil authorities found that the *same* series of questions had previously, on several occasions, been proposed to the supposed demon who inhabited the Superior's body. They demanded that all further exorcisms should be performed in conjunction with exorcists appointed by civil authorities. Mignon simply asserted that they had not objected to the presence of the civil authorities; and Barré asserted that he had discovered, instead of one devil, *Astaroth*, tormenting the Superior, there were really seven, whose names he glibly recited. The history of the *pacte* was as follows: "Urbain Grandier had delivered it, in the form of a bouquet of roses, to a certain Jean Pivart—a magician of an inferior order— ; this Pivart gave it to a young girl, who had thrown it over the garden wall into the convent." The authorities demanded that they should be allowed to see the possessed. But the energumens exhibited *then* neither contortion nor grimace, and chanted quietly, along with the other sisters, during the celebration of the mass. On another occasion, however, the Superior was seized with convulsions, foaming at the mouth, and the demon, when asked at what time he would leave her, answered, *cras mane.* He resisted the litanies and even the power of the holy ciborium, when placed on the head of the possessed. Shortly after the Superior regained her natural condition and, smiling, said to Barré: *Il n'y a plus de Satan en moi.* A circumstance is related here that was very common in demonopathia, the Superior, freed from this crisis, neither recollected the questions or answers. She pretended that at ten o'clock at night her hand had been seized and pricked, and that immediately afterwards she discovered three spines in it.

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* The following queries and answers are said to have been made by the exorcist and given by the demon, possessing the Superior. Q. Propter quam causam ingressus es in corpus hujus virginis? A. Causâ animositatis. Q. Per quod pactum? A. Per flores. Q. Quales? A. Rosas. Q. Quis misit? A. Urbanus. Q. Dic cognomen? A. Grandier. Q. Dic qualitatem? A. Sacerdos. Q. Cujus ecclesiæ? A. Sancti Petri. Q. Quae persona attulit flores? A. Diabolica.

A cat being found in the chamber, it was declared to be the demon, but the cat proved to be an old attaché of the convent. A large bouquet of white roses was gathered in the garden, and was thrown into the fire by Barré with the hope of eliciting some preternatural phenomena, but they only burned in the natural way. Barré, however, pledged his faith as an exorcist that he would compel the devil to leave or to make manifest, in a most indubitable manner, the possession of the Ursulines.

Let us see, for the clear understanding of this curious event in history, who was Urbain Grandier. He had been a student with the Jesuits at Bordeaux, afterwards *curé* of the church of St. Peter at Loudun, and a prebend in the chapter of Sainte-Croix at the same place. This possession of two benefices irritated his brethren,—and, moreover, he was a good preacher, an easy and elegant writer, and a gallant, attractive gentleman. Charges had been brought against him involving his moral character in the most absolute way. A large number of persons figured as his accusers, although they did not appear against him on trial. He was condemned to fast on bread and water for three months, interdicted *a divinis* for five years in the diocese of Poitier, and forever in the city of Loudun. Having appealed to the parliament of Paris, the whole affair was entrusted to the *Presidial* of Poitiers. Here the sentence was reversed, and the archbishop of Bordeaux absolved him from the ecclesiastical penalty. Grandier used his triumph so as to annoy his enemies as much as possible, re-entered the city shaking a laurel branch as a token of his victory. His fame having penetrated the convent, associated with reports of his eloquence, and beauty, contests with and victory over his enemies, without doubt was the cause of his name being suggested to the poor nuns, in the height of their hysterical attacks, as the cause of the same.

But to proceed with our epitome of this history,—Grandier demanded that the nuns be examined separately and by approved exorcists, who were at least not his open enemies. However, the exorcisms were carried on in church by the same Barré. The possessed always answered in Latin, indicative of bad grammatical training, and full of solecisms. In every case, the name of Grandier was mentioned as the magician. A series of contradictions having been from time to time detected in the communications of the quasi-possessed, the archbishop of Bordeaux sent his own physician to examine into the matter, but nothing being discovered by him, the prelate forbade the pretended exorcists from hereafter practising the art, and assigned its practice to two priests. No more indications being found, in the convent, of demonopathia, Grandier was again triumphant.

Such triumph could not last long, especially in an age when the really mysterious was being overlooked in the

Church, and mankind was on the alert for something that should claim its wonder. Despite the contradictory and improbable character of the testimony, he was at length condemned to death. The only proof was that arising from a persistance, on the part of the accused, in their accusation. Grandier was finally burned at the stake. His last words were: "Deus, Deus, ad te vigilo, miserere mei, Deus! While the priest Lactance was lighting the fire, Grandier said—there is a God in heaven, who will be both thy judge and mine,—I summons thee to appear before him in one month. It is a singular fact, that Lactance died exactly one month from the death of Grandier, in frightful convulsions, as though he had been possessed of all the demons that he had been pursuing.

The death of Grandier did not diminish the troubles in the nunnery. We sicken as we read the details of incidents, connected with demonopathia among these females, who had separated themselves from the world with the view of serving God, but who, on the contrary, were contributing to the support of the worst passions and feelings of their fellow men, by enabling them to denounce any troublesome person as a magician. "The mortal blow to the whole, was the withdrawal of the pension of four thousand livres per month, which the king had allowed for the support of the exorcists and the nuns. Richelieu began to believe that if it were continued longer, the farce would only serve to exhibit the injustice of the condemnation of Grandier; * * his own death (Dec. 18, 1638) was the signal of the definitive flight of all the inferior demons that still swarmed about Loudun." The nuns, nevertheless, were the recipients of distinguished honors. "Jeanne de Belfiel—the mother superior—one of the principal actresses in the troop, was the object of the greatest favors. Presented at Court, she was complimented by the King and Queen, and honored by the benediction of the cardinal-minister, * * she lived for years, surrounded with an aureola of sanctity, and wanted nothing to prevent her canonization after death."

Can modern science aid us in comprehending this curious episode in the history of the seventeenth century? Esquirol considers all the phenomena, exhibited by the nuns, as symptoms of what he styles *demonomania;* Bertrand claims that they were only phenomena of extacy. Figuier puts the whole matter very forcibly before his readers, as follows; "The convulsions proceeded from hysteria, The disease was perfectly marked in three of them. We believe that it existed *a priori* in the convent, and that it caused the first convulsive and contagious symptoms, through imitation. But this affection, the nervous system being constantly irritated, gives rise to such a physiological condition, that every physical or moral excitement would bring this system into play, provoking disorders and extraordinary cries from the sick person. Indeed young hysterical girls are now considered marvellous *subjects* for magnetizers. The hysterical nuns thus became pliant tools, in their fits of somnambulism, in the hands of the zealous exorcists." They were to a certain extent moved at the suggestion of the latter, to adopt any ideas which might be presented. The name of Grandier had been associated with every thing calculated to bewilder and charm the young, for he had beauty, talent, wit and reputation. It was an easy matter to make one, who had allowed her mind to dwell upon him, to believe that he was the cause of the convulsions to which she was subject. Imitation would soon place others in the same position. The general belief in magic easily induced them to charge this, upon the gay and handsome young priest. These were the days, our readers will recollect, when ugly, old women were put out of the way, by first being charged with witchcraft and sorcery, and dashing youths were disposed of under the plea that they were magicians. The old proverb reminds us that "to give a dog a bad name is the sure method of destroying him," and we know that even a dog may be scared to death when a tin-pan is tied to his tail. We can destroy a man, either by exciting the public against him, or by so wounding his own sensibility that he shall shun the public eye.

With the above mentioned causes inducing the belief that they were under some influence of Grandier, it is easy to perceive how the nuns would feign demoniacal possession. The latter gave them notoriety,—brought them prominently before the community. This notoriety was too dear not be preserved at any price. Thus, the first wrong step having been taken, the path was comparatively an easy one through deceit, and lies innumerable. The devils of Loudun would be exorcized now, *not* by ecclesiastical butby medical treatment, and their history would be a very short one.

The fall of the Jansenists in 1720 had been accomplished, after protracted and vigorous efforts on the part of the Jesuits. The propositions of Quesnel had been the cause of much dissension, and ecclesiastic quarrels had become a disgrace to the Church. At this time of defeat and overthrow of the Jansenists, they began to exhibit miraculous phenomena as a "protest against their overthrow and with the view of showing the world, that Providence did not approve of the judgments pronounced on their cause by men." Shortly before this period, James II, of England, found his greatest consolation in exile, at Saint Germain, in *touching* those afflicted with scrofula. The king's touch was supposed to be endowed with miraculous healing properties. After his death, the Jesuit fathers claimed for his tomb still more wonderful properties. "The sainted monarch, says Salgues, did not confine himself to curing the King's evil; he made the lame to walk, gave suppleness to the limbs of the gouty, corrected defective vision and untied the tongues of stammerers and mutes."

It was necessary that the Jansenists should show some signs as wonderful as those exhibited at the monarch's grave. Vialart, archbishop of Châlons sur Marne, had exhibited great piety conjoined with gentle tolerance during his life, had opposed the persecution of protestants, and the stigma thrown on the character of Jansenius by the charge of heresy. At his grave, rheumatisms, diseases of the skin and ulcers were relieved almost instantly. Investigations being had, the following results were announced by the examining physicians in the case of thirty four miracles reported,—twenty two were explainable from causes purely physical, eleven were probably supernatural, and one necessarily so.

But the reputation of these was overshadowed by that of the Abbe Francis of Paris, more familiarly known as Deacon Paris. He had lived a life of extreme religious mortification, which was terminated by death, May 1, 1727. His remains were interred in the cemetery of Saint Medard, and the grave became the scene of some of the most astonishing performances ever executed by religious fanaticism. The first cure was alleged to have been performed in the case of an old-clothes-man, Pierre Lero, who had been suffering from indolent ulcers on his left leg, which had resisted all the treatment of his barber-surgeon Tanson. He was carried to the grave, gave twelve sous to a good woman to perform a *neuvaine* (nine days devotion) for him, twelve to a sacristan to have a mass said. In addition he obtained a piece of the bed of the deacon which he applied to the leg and *kept himself quiet.* On the tenth day, he was cured and the cure was considered a miracle performed by deacon Paris. This case was followed up by the cure of Marie Jeanne Orget, who for thirty years had been treated by physicians and surgeons for erysipelas. Being carried to the cemetery, she prayed the saint that she might not only be cured, but be supplied with strength to work for her support (she was then 57 years old). The relief was immediate, and she was able to leave the cemetery without assistance. It is true, that the recovery of this woman was seriously doubted by the Jesuit fathers, and that she had said nothing about the cause of it until obliged by her Jansenist confessor, still at her last moments she repeated her belief in the presence of the notaries.

These quasi miracles were nothing to what followed, when a tomb was erected over the remains of the deacon, around which were to be exhibited those wonderful convulsions and transports of prophetic delirium, which attracted the attention of all France and made the account of the "*Convulsionnaires Jansenistes*," occupy a curious place in the history of the last century. After the erection of the tomb, the miracles, asserted to be effected by the efficacy of the saint, increased. A girl afflicted with paralysis was cured, and other cases followed so rapidly, that Montgeron, published in three large quarto volumes, an account of the miracles operated through the intercession of the deacon. "The cemetery of Saint Medard, although all the soil and stones contained therein partook of the efficacy of the ashes of the deacon, became a theatre too small for the expansive nature of the work to be performed. It extended to other churches and cemeteries." The Jesuits availed themselves of the power of the government, and soon the Jansenists obtained the benefits which accrue from a vindictive persecution.

Now began the famous convulsive movements, which always accompanied the cures of those who resorted to the mortuary shrine of the Abbe Francis of Paris. Our limits warn us that we can only furnish an account of one case, but *ex uno disce omnes*. We cite the case of Marie-Anne Vassereau, who was laboring under a frightful aggregation of infirmities: swelling of the legs, resulting from badly treated small pox, paralysis, lachrymal fistula, caries of the nasal bones &c., &c. "At first, the spirit of the saint made no remarkable demonstration. But as she heard mass, Dec. 1, 1731, her body was seized with tremblings; she entered the cemetery and the tremblings increased; she approached the tomb and they became convulsions. On the next day the spirit of the saint acted still more strongly. Her head became confused,—her legs, arms and thighs were extraordinarily agitated. She lost consciousness, but, being carried in the charnel-house (*charniers*) and restoratives being applied, she recovered. She returned home, but the convulsions attained such a character then, that the domestics and neighbors were required to hold her limbs. The convulsive movements accompanied her when she walked out, so that passersby were obliged to prevent her from breaking her head or throwing herself in the river. The days following exhibited similar scenes. She attained curious notoriety in the Faubourg of Saint-Jacques, and nothing was spoken of, save the convulsions of Marie-Anne Vassereau. Her nurses were deprived of all rest; she fell in the pews, in the kitchen and wherever she went." Finally the relief came———. The denoument arrives, somewhat after the *ridiculus-mus*-order of the poet.

"These convulsions were the signal that lighted up a new dance of Saint-Guy, resuscitated in Paris in the eighteenth century, with infinite variations, some more lugubrious or buffoon-like than others. From all quarters of the city they ran to the cemetery of Saint-Medard, to participate in the shiverings, or *crispations*, and tremblings. Sick or not, each pretended to fall into convulsions, and had his own style of convulsions. It was a true tarentula-dance. * * The soil of the cemetery and the adjoining streets was an arena of contention for a multitude of girls, women and invalids of all ages, who zealously contended in convulsions. Men on the ground struggled in real epilepsy, and some swallowed pebbles, bits of glass and even live coals." The most indecent and filthy exhibitions were made by both sexes, and, in the name of religion, things were perpetrated which would not have been tolerated in the Saturnalia of pagan Rome. Certain of the *convulsionnaires* assumed positions representing some religious mysteries, selecting especially scenes from the Passion. "In the midst of all this, nothing was heard but groaning, singing, howling, hissing, declaiming, prophecying, and caterwauling. But what predominated in this convulsionary epidemic was the dance. The chorus was conducted by Abbe Bècherand, an ecclesiastic, who stood, so that every one could see him, on the tomb of the saint. There he daily executed, with a skill above all rivalry, his favorite *pas*, the famous saut de carpe (somer sault), which the spectators never tired of admiring. The Abbe himself belonged to the number of those who had undergone the curative convulsions. One of his legs was fourteen inches shorter than the other,—a defect however which did not interfere with his favorite dance. He declared that the leg was lengthened, every three months, one line."

"On the twenty seventh of January 1732 the cemetery was closed and the entrance walled up by order of the king." A distinguished, Jansenist lawyer, named Carré de Montgeron, going to the king to present the book he had written to demonstrate the truth of the miracles, was brutally arrested and thrown into prison, where he died after seventeen years imprisonment. The *convulsionnaires* were now treated with the greatest rigor, and, of course, thrived under it amazingly. Although tracked from street to street, driven from *quartier* to *quartier*, they increased in numbers. The chevalier Folard, distinguished for his contributions to military writings, was soon affiliated with them. His religion was nothing. Curious to observe the operations at Saint-Medard, he went to the cemetery. There, wounds received in war were cured, and seven days afterwards he was attacked with convulsions. He renounced all his honors and expectations, and made the rest of his life a series of convulsions, associating only with those who frequented the houses of *convulsionnaires*, or spending his time in prayer and reading books of devotion.

The cemetery being closed, a new phase was assumed by this religious mania. Patients submitted their bodies to blows from hammers and bars of iron, to cuts with knives, upon the breast, abdomen, hips, and thighs; and the victims, instead of complaining, expressed their joy. The convulsionnaires believed themselves specially set apart for the general work of edification, and with the view of accomplishing this, in the best possible manner, adopted the brutal maltreatment of their bodies, and those of their followers. They called the inhuman violences, to which they were subjected, *secours*. These were known either as *petits secours*, consisting in blows with the fist and small sticks of wood, stampings and other similar operations,—aud *les grand secours* or *secours meurtriers* which were of a more terrible character. They pretended that all this was required to aid in the restoration of a corrupt and gangrened church.*

In 1741 the excitement seemed to have ceased in Paris, but in fact the convulsionnaires still existed, and eighteen years later, it was found the epidemic was raging in all its force. We are indebted to a report of La Condamine for an account of one of their exhibitions April 13, 1759, to which he had gained admission by a subterfuge. A number of males and females had collected together in a chamber at Marais. Sister Francoise, the deanness of the convulsionnaires, was first beaten, on all parts of the body, with a bundle of chains weighing 8 to 10 pounds, by two men. This was followed by blows with sticks of wood, and being placed on her back on the ground the director walked over her several times. This woman was then *nailed* to a cross, and allowed to remain there for thee hours and a half. At the same time, a young proselyte, Sister Marie, was nailed to another cross and allowed to remain attached to it for half an hour. La Condamine remarks that "only girls and women have submitted to this cruel operation. Those who recognize in all this a good work, assert as a proof of the miracle that the victims do not suffer, and that on the contrary their torments are agreeable. This would be, indeed, a great prodigy. But I saw them give indications of the keenest anguish, and the only astonishing feature to which I can testify is the constancy and courage that fanaticism was able to inspire." The performances of the Hindoo devotees are not more sickening in their details than these;—the deluded worshipper at the shrine of Juggernaut does not resort to more horrible tortures than the convulsionnaires willingly exposed themselves to, in the name of Him who claims worship from the heart, and who exhibits to his disciples the example of the publican, with his penitent cry for pardon, as that of one who "went down to his house justified" rather than the Pharisee who thanked God that he was not as other men.

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* Elle est couchè dans l'ordure et dans la poussière, s'écriait une convulsionnaire, les vers lui rongent la chair, la pourriture s'est mise jusque dans ses os, une odeur insupportable s'exhale sans cesse de la corruption qui l'enveloppe. Venez donc à sons secours, appliquez-y le fer et le feu, n'épargnez rien pour la guérir, coupez, tranchez, brûlez : il lui faut les remèdes les plus violents."

Dom. Lataste, *Lettres Theologiques.* Quoted by Figuier.

With the close of 1760 Paris was freed from this terrible form of religious mania, although the end was not then of the miraculous cures attributed to the deacon Paris. With our knowledge of the years required to uproot a superstition from the hearts of the people, we may not be surprized to learn, that instances of miracles worked in the name of the deceased deacon are recorded as late as 1787,—and it may be that our own enlightened age has witnessed similar instances of delusion. Error is hydra-headed,—the removal of one head seems to give that stimulus which, in time, will cause another to shoot forth in fullest vigor.

Figuier attempts an explanation of the singular phenomena we have briefly laid before our readers. Two things are required in order to make such an attempt successful; careful examination, 1st of the facts, 2nd their character whether natural or miraculous. And here again, let us not be too easy with our definition of what is miraculous. In one view, all nature is a miracle past the finding-out of man,—the human body, something calculated to excite our awe as well as admiration. How wondrous the law which keeps its manifold organs in harmonious relations to each other! Why do the disturbing actions of natural causes not injure or destroy this harmony and thus bring about, that which we call, disease? And when disease is raging, who can explain how all the mysterious harmonies of health are brought to play in happy accord again? All this is a mystery,—yes, a mystery past finding out. We are still playing on the sea shore,—collecting the beautiful pebbles which the waves have cast up from the deep, but the boundless expanse of the unknown extends off into the distance. Let us learn humility and reverently bow before the Omnipotence of our Creator and Preserver. "Miracles," as has been stated by a writer in this Review (Vol. II. 578), "must themselves be authenticated as genuine heavenly miracles, by carrying in them proper spiritual contents, and by being surrounded with proper spiritual connections and relations. They are of force, not abstractly and on the outside of the revelation or mission they are employed to prove, but concretely and in living union with this, as part and parcel of the whole." Judged by such a norm as this, all these miracles are dissipated as the morning clouds before the light of the sun. But we can afford to examine these epidemic convulsions more closely, so as to get at their physiological cause.

In examining the facts connected with the convulsionary epidemic, we must admit that cures were had of some of the numerous sick who crowded around the deacon's tomb. But these were very few indeed,—only fifteen or sixteen among the large number of devotees, whose exercises are narrated by Carré de Montgeron. These, however, are of such a character, that we do not require resort to the supposition of a miracle to explain them. The only argument in favor of any connection between the cures and the visits to Saint-Mèdard, is that those occurred after the visit had been made and a *neuvaine* performed. The validity of the *post hoc, ergo propter hoc* argument has been exploded long since. Still *this* argument cannot be adduced, "since the cures took place very arbitrarily, sometimes before, sometimes during and often even very long after the worship paid to the saint." No desperate cases were in fact ever brought to the notice of the saint, and some of the so-called cures proved to be deceptive as the relapses indicated. These induce us to believe that the diseases were often feigned. And some of the convulsions were voluntary imitations of those witnessed in the cemetery, as was acknowledged afterwards.

Among the convulsionnaires there were some epileptics, —and involuntary imitation caused the semblance of this disease in some which may finally have really become the disease itself. Watson, in his Practice of Medicine, quotes the following from Baglivi. Vidimus, anno 1670, in Dalmatiâ juvenem gravissimis correptum convulsionibus, propterea quod inspexerat solummodo alium juvenem dum epilepsiâ humi contorquebatur: and states that "there is no *spectacle* of horror so efficacious in producing a fit of epilepsy in others, as that of a person suffering under epilepsy." The symptoms, generally presented by these fanatics, were simply due to a species of nervous affection, which was either St. Vitus' dance, epilepsy or hysteria,—and the latter was probably the principal cause. The curative means recognized as proper for the latter were generally efficient. Occasionally the adoption of purely moral treatment proved sufficient. At one time there was a suicidal epidemic in Milet, among the girls, and the town feared depopulation. It was checked by a decree, that the ~~every~~ body of ~~a~~ every girl who hung herself should be exposed naked in public, and then be dragged by a cord around the neck on a hurdle. The decree cured the disease.

Boerhaave's cases at the Harlem hospital are known to medical men. All the female patients in one of the wards fell into convulsions in imitation of one naturally so affected. He brought into the ward, a chafing dish full of live coals, and proceeded to heat a steel instrument red hot, announcing that he would burn the first patient who would have a convulsion. The result was—the disappearance of the disease.

A word or two as to the cause of toleration of painful blows and cuts, which were altogether disproportionate to the feeble strength of those receiving them. "The power of resistance and the condition of insensibility seem to arise from the extreme changes in sensibility, which the exaltation of any passion will produce in the animal economy. Rage, fear, in a word, any passion, having reached its climax, can produce such insensibility. * * Moral excitement often extinguishes all sensibility. Soldiers with fatal wounds, have continued to fight, without suspecting their presence, until they have fallen dead. * * In Italy a fanatic having crucified himself his physician reports, that he suffered nothing from his wounds during the religious delirium, although he experienced horrible sufferings when reason had returned." From all the foregoing it will be readily concluded, with our author, that there was nothing in the convulsions and extacies of the Saint-Médard cemetery, which is inexplicable by the laws of medicine, physiology or psychology.

Towards the end of the seventeenth century, the spirit of persecution, evinced by the Romanists, excited a species of religious fervor among the Protestants, which manifested itself in erratic acts that entitle the "Protestant Prophets" to a notice in our retrospective of the marvellous in Modern Times. Louis XIV, in the midst of his debauches, was sometimes visited by compunctions of conscience and dreams of future punishment. His spiritual advisers suggested that he could ensure his own salvation by securing proselytes from the heretical reformers to the ranks of the Roman Church,—and that the best way of accomplishing this was by means of money,—purchasing the poor. Under the direction of Cardinal Le Camus, this important business of bribery for religious purposes was carried on by Pellisson, an apostate Calvinist. Among the poor classes of Huguenots this plan, it is asserted, had some success. The medium price allowed did not exceed a crown of six livres. The additions to the list of converts were shown to the king, every quarter, and the courtier, Pellisson, endeavored to make the monarch believe that the whole world would yield either to his might or his benevolence. The king became more anxious to increase the church, and adopted every cruel plan suggested by the bigoted Romanists; in 1680 twenty Protestant churches were destroyed in Vivarais. Children were allowed to abjure their religion at seven years of age; and many were taken away from their parents in the provinces, simply because they had learned the *Ave Maria* from the servants, which was an evidence of their desire to abjure Protestantism. This act, so similar to that of the Mortara boy in Italy, which created so much excitement a few years since, was in violation of all the protection guarranteed by the Edict of Nantes. It was only the signal for persecutions in a thousand forms each more ingenious than its predecessor. A regular system of compulsory retraction was established under the agency of Louvois, the minister. Bribes were changed for force. A dragoonade of the country, beginning at Bearn—the birth-place of Henry of Navarre, was adopted and soldiers were employed as the missionaries of a religion professing to breathe peace and goodwill. Voltaire* thus speaks of the manner this dragoonade was begun : "An archbishop, an intendant, a pastor, or some one with authority marched at the head of the soldiers. The principal Calvinistic families, especially those considered most pliable, were assembled. These renounced their religion in the name of the others : the obstinate were delivered over to the soldiers, who were allowed to do any thing with them but take their lives. Notwithstanding this, some were so cruelly treated that they died."

Louis XIV, thinking to free his kingdom at once from heretics revoked the Edict of Nantes, October 22, 1685. The Chancellor Le Tellier signed the fatal measure, crying out with hideous joy, "nunc dimittis servum tuum &c." Bossuet expended his eloquence in a funeral oration on Le Tellier, prostituting it thus in a most disreputable manner. The Revocation caused a general migration. Fifteen hundred ministers left the country ! "Holding the Bible in one hand and their walking staves in the other, they set out for the different frontiers of the kingdom." These were followed by their people, when the laws and ordinances of the king had become insupportable. For a Protestant to live in France at this period was a continuous martyrdom. "He could neither marry nor make a will; his children were considered bastards." All the liberal professions and municipal offices were interdicted. He was allowed only to be a laborer, mechanic or shepherd. Religious worship was prohibited. Death was the punishment for an Evangelical minister who remained in France; death for every one engaged in Protestant worship, or caught in a worshipping assembly.

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* Essai sur l'histoire genérale.

This series of cruelties was established by the much bepraised Louis Quatorze,—"the most magnificent of the Bourbon kings." At length, the Calvinist peasants took arms and a religious war was the result, During this war the phenomena now to be noticed occurred. The pastors had said to their flocks, before leaving them, "Fear not: although we shall not be with you, the Spirit of the Lord will not desert you; He will not cease to be in the midst of your assemblies,—He will speak through the mouths of women and children." These words were literally received. Deprived of their churches, they assembled in the woods and mountain-fastnesses. Their preachers braved death to be with them. A religious zeal had been fostered by cruel persecution until a species of fanaticism, purely epidemic in its consequences, seized those who were thus hunted down under the ban of law. "The mountains and desert-places were peopled with phantoms for them, and resounded with revealed words." At Geneva, a school of prophecy was established, and Du Serre, a glassblower who had been ennobled, was there ordained prophet. He established a similar school, in 1689, in Dauphiny. Children were instructed in this school, by a regimen calculated to excite their imaginations in a morbid way, by long fastings, long sermons and the perusal of the Apocalypse. They soon acquired the power of entering an extatic condition, assuming singular positions. These were sent forth and constituted one party of the protestant Prophets.

But, in the neighborhood of Castres, in 1686, demonstrations were also shown of the same spirit. Indeed we may see that this epidemic broke out in many different places, at about the same time. The same persecution followed the Protestants all over France;—they were subject to want and distress every where;—the same intense religious feeling existed with them all,—and the results were alike. A little shepherdess, 10 ten years of age, asserted that an angel appeared to her and forbade her to attend mass. This was soon noised abroad. The little spark speedily became a large fire. While a famous preacher, Corbière was preaching, the assembly was surrounded and dispersed. The preacher being pursued described a circle around himself, and crying out, "Get thee behind me, Satan," the troop was so horrified that they were about retreating when their captain killed him with a pistol.

Two of these prophets deserve special notice. Isabeau Vincent and Gabriel Astier. The first known as La belle Isabeau was the daughter of a wool-carder at Saou, in the diocese of Dié. Being forced to leave her home, her godfather gave her an asylum, and the occupation of guarding his sheep. While engaged here, it is supposed, that one of the prophets, ordained by Du Serre, met her and that she became impressed with her mission. Commencing in obscure houses, her fame soon spread through Dauphiny. A young lawyer, Gerlan, became attached to her and followed her to the various assemblies, where she prophesied. The notes of her prophetic speeches are given in full, in the writers of this period. On his first visit, he describes her as "a young girl of small stature, irregular countenance, thin and browned by the wind, with a large forehead, large gentle black eyes." At times she was not able to speak, and she would pray God to loose her tongue, so that she could speak to his people. Gerlan says, she spoke like an angel. At times she fell into so profound a lethargy that violent measures could not waken her to consciousness. In this condition, she would chant the psalms in a clear and intelligible voice. Afterwards she would improvise prayers, recite long passages from the Scriptures, denounce the papists, and preach with considerable force. After the extacy had passed by, she did not recollect any thing that occurred.

The reputation of La belle Isabeau was increased by the frequency of these lethargic states. Important conversions were made by her. Among the aristocracy of Dauphiny, Madame de Baix may be mentioned. She became also inspired, and communicated her inspiration to her daughter. Madame de Baix was obliged to leave the province. She retired to a house on the left bank of the Rhone.

Here more than three hundred, who heard her, were seized with the same spirit of prophecy. Isabeau being seized by the Intendant, told the judges, who threatened her with punishment: "You may kill me; but God will raise up other prophetesses who will speak better things than I."

She was confined in a hospital, where the aristocracy contended for the honor of instructing, caring for and amusing her. But the confinement of La belle Isabeau was not ended by death, but by marriage with a gentleman of the region and—her preaching ceased.

Gabriel Astier was one of the disciples of Du Serre. He communicated to his parents and sisters first the information, that the Spirit had been given him. He was obliged soon to fly from home, and after passing from place to place, he selected the Vivarais. Numerous proselytes were made on the road, who followed him to the mountains where the spirit of the Vaudois and Waldenses had left indelible traces. He was said to have been a most extraordinary orator, at a time when much pulpit oratory was known. Figuier says "it seemed as though in all these towns (Saint-Cierge, Pranles, Saint-Sauveur, Tauzuc, Saint-Michel, &c., &c.), there was no other care, no other want, but to hear the voice of the man whom they regarded as a messenger from God. The villages were too small to contain all who came to hear Gabriel, and it was necessary to hold religious assemblies in the open country, in spite of winds and snows." To these, all ages, sexes and conditions came; in many instances, they remained days from home, following the prophet from mountain to mountain, subsisting simply on apples and nuts.

William of Orange had been placed on the British throne, and the French Protestants looked for relief from him. Gabriel announced the day on which the Prince of Orange might be expected to arrive in France, with an army of a hundred thousand men, as the exterminating angel of the Roman Church The houses of worship of the Catholics would then be demolished, and a star falling on Rome would consum the pontifical chair. It is remarkable amid all this excitement, and the whirlwind of enthusiasm by which Astier was surrounded, that he *never* counselled violence. He and many prophets of this period, "were content with preaching obedience to God *rather than* to the king,—assuring their hearers that the faithful had nothing to fear, for God would sustain and preserve them from the sabres and balls of the enemy." And this faith and trust in God seem to have been existing in all their followers. The Protestants were hunted down in all directions. Gabriel had been in forty combats, but was finally taken at Montpellier and condemned to be broken alive on the wheel,—a punishment to which he submitted bravely, April 2, 1690.

Vivens was another of the prophets. He was distinguished for his stout and healthy body, intrepid and adventurous spirit, and true courage. Induced to believe that the day of redress for the persecuted Protestants was at hand, he returned to France from Holland in 1689. He counselled resistance; occupied himself with collecting arms, and fabricating powder and balls. He organized the first insurrection of Cevennes putting himself at the head of four hundred armed men. These were nearly all killed or taken prisoners at the first engagement. Vivens escaped, and retiring to a cavern, was kept advised of the movements of his brethren. Here he was joined by Brousson, who was actuated with the same hopes, but who did not think of their realization by violent means. Brousson had been the protestant advocate, and was then an evangelical minister, who considered it as his duty to preach and even to die for his religion, but not to push disobedience to the king to the point of revolt. He believed that he had a mission to perform, but his unchanging sweetness he and deep aversion to violent measures made him a character pleasant to contemplate even at the present day. Brousson was ordained a minister by Vivens, who had received ordination in Holland. "B. preached regularly three times a day; attended to baptisms, marriages and deaths—all ceremonies equally sad in those times; dictated forms of prayers, pious manuals to be used by churches, who had no pastors." His life was spent in teaching rustic and almost savage hearers, the gentlest notes of gospel truth, lying at night on the ground or a bed of dry leaves. Stealthily creeping out of houses, to avoid searching parties, he was obliged often to take shelter in the wells, or on the roofs. At length he was arrested and condemned to death for complicity in Vivens' plans to introduce a foreign army into France, and the sentence was executed at Montpellier on the same day. Vivens was killed in a cavern by an apostate Jourdan, who shot him from behind. His body was afterwards burned, and in the flames his face seemed to threaten his executioners.

The enthusiasm, which had been so excessive, was somewhat restrained by the deaths of the prominent prophets, the general slaughter of the people, and the peace of Ryswick. In 1700 a maiden lady carried the prophetic spirit to the Cévennes. She communicated the spirit to a few, and these to others, until the prophets had become thousands. Women and children were peculiarly seized. Eight thousand were said to be affected this way in the Cévennes and lower Languedoc. A commission of physicians was assembled to examine a number of these children, who had been imprisoned at Uzes. The commission did nothing but call the children fanatics, and expressed their wonder at seeing illiterate children quoting Holy Scripture most appropriately. Such an examination only increased the furor. Catholic children were seized with it and made "revelations most compromising to their Church. Their extacies were not checked by menaces or punishment from their parents, * * who delivered the poor little creatures to the exorcisms of the curés. No old Catholic was persecuted on this account; but the converts received orders to prevent their children from becoming fanatics." The accounts laid down by authors of the period are most incredible, because they refer to children from fifteen months to three years of age, who were said to preach amendment of life to those around. Those who were sent to prevent them prophesying were often seized in the same way.

The inspiration then became communicated to families. Along with the gift of speech, that of second sight was said to be possessed by some. This was shown in predictions as to impending disasters, and directions as to the proper mode of avoiding them. There was one thing to be said of these prophets, which we were not able to affirm of the "possessed" of Loudun, or the "convulsionnaires" of Saint-Medard,—"those who professed to have received the graces, immediately gave up all kinds of libertinage and vanity. Some who had been debauchees became sedate and pious."

The increase of the prophets increased the meetings. These became more numerous; daily and nightly they were held, despite the prohibition of laws. Some of the prophets began to labor under the strangest delusions. Daniel Raoul pretended that he was animated with the spirit of the prophet Daniel. He was sentenced to be broken on the wheel, and marched to the scene of his death, acknowledging Christ as his Saviour, and denouncing, as idolatry, the practices of the Roman Church. Persecution could not diminish numbers, although it was pushed to the extreme. At Creux de Vaie so great was the massacre committed that, in addition to the killed, a bark and two wagons were filled with the wounded and sent to Montpellier. A prophet was among these with his four sons. He was hung, three of the sons were condemned to the gallies and the fourth died in prison.

Several women were gibbetted, because they ran about, crying "God has given us tears of blood to weep for the desolation of Jerusalem," while drops of blood trickled from their eyes and noses. Prophecies now multiplied about some great coming event, the object of which would be the reestablishment of the Protestant religion. Abraham Mazel, Solomon Couderc and Pierre Séguier, the great prophets of the mountains, began to predict that certain persons were destined to chastise the enemies of truth. These predictions and the increasing cruelty of the Catholic priests, brought on at last the general insurrection of the

Cevennes. The abbe Du Chayla figures with bloody notoriety among his co-religionists. An attack was made on his chateau, under the direction of Esprit Séguier—*le terrible prophète*, by fifty three men, all singing on their march one of Marot's psalms. The chateau was burned, and Du Chayla, after refusing his life on the score of renouncing his religion, was killed. Each one of the party struck a blow, crying "this for my father whom thou didst destroy at the wheel." "this for my brother sent by thee to the gallies," "this for my mother, dead of grief occasioned by your persecution" &c., &c. The bloody massacre of the archpriest and his servitors was followed by prayers, offered while kneeling around the dead bodies, and psalms.

Seguier now destroyed the crosses and all the insignia of catholicism in the churches. The torch was lighted and the whole region was exposed to the horrid devastations of a civil war. Seguier however, being seized, was burned alive, August 12, 1702. His place was soon filled by Laporte, who assumed the title of "Colonel of the children of God." He and his nephew had been soldiers in the king's army, and the military knowledge there acquired, with the extatic inspirations they claimed, gave them peculiar power. Churches were burned on all sides. Laporte Senior was killed at the head of his troop. His nephew Roland became the chief leader of the religious insurrectionists, under the title of "General of the children of God." He organized his army in five legions, properly divided. The army was singularly supplied with arms. "Their guns were unlike in form and calibre; the sabres, pikes, bayonets and swords were of all varieties." Each chief of a legion governed with absolute authority, and celebrated religious worship in his camp, baptized and performed marriage services. His commands were looked upon as orders from God. But we cannot go further in detail as to the circumstances of this religious war. It was bloody in the extreme. Each side, animated with religious fanaticism, destroyed those of the other party in the most ruthless manner. Finally a treaty was had at Nimes between Cavalier, the young Protestant general, and Marshall Villars, which allowed *not* the religious liberty for which they had been contending, but that Cavalier should be received as Colonel in the French army with a regiment of his men to be employed in the war on the Rhine and in Spain. Immunity for past deeds had been granted, but this was not what actuated Roland, and he rejected, with contempt, the treaty of Nimes. "You are foolish," said the bold prophet leader to the young chief, "you have forgotten that you are not the general; you have betrayed your brethren and should die with shame. You are nothing more than a vile agent of the Marshal. Go tell him, that I am determined to die sword in hand for the entire reestablishment of the Edict of Nantes." Finally Roland was calmed, and he wrote a letter to the Marshal stating the true conditions of peace. The prophet Salomon and Cavalier were the bearers of this letter,—the former declared the children of the Lord would not lay down their arms, unless free exercise of their religion was allowed them. The conference was broken up by the Marshal in a rage. Cavalier found the camp in full revolt against him. Ravanel, one of his principal officers taunted him with being a coward and a traitor. The officers cried "no peace without liberty of conconscience, and the return of our pastors, the reconstruction of our churches." The *general* was sounded, and the troops formed to start out again for the continuation of the war. Cavalier followed, begging and entreating them to change the plan, but to no purpose. The soldiers received his prayers in silence, and Ravanel with insult and sarcasm. Each drew his pistol on the other. The prophet Moise prevented the fratricidal contest. Cavalier at last bade adieu to his comrades and left them in disgrace. His history is told in few words. He became a colonel in the French army, was received at Versailles with honors, soon attached himself to the Dutch army, and finally died in the British service as a Major-general and Governor of the island of Jersey.

The brigade now under the command of Ravanel was surprised at Marjevols and suffered the loss of two hundred men. But the close of the whole war was due to the death of Roland, by treachery. He was surprized at the Chateau of Castelnau, where he had been visiting Mlle de Cornelli, for whom he had a species of platonic love; endeavoring to escape he was killed by a ball from a carbine.

We close this portion of our article with an extract from Figuier: "Thus perished, at the age of thirty, he who had given to the Cenevole insurrection its regular organization, and had held in check, with three thousand peasants, two French Marshals and an army of sixty thousand men. Roland Laporte, General of the Children of God, says Peyrat, united the indomitable tenacity of Coligny and the useful and sombre enthusiasm of Cromwell. Being possessed of the stormy element of extacy, he made it the foundation and rule of an insurrection, which he organized, nourished, clothed, sheltered, for two years in the desert, despite the rage of men and seasons ; contended with three thousand combatants, against hostile people, sixty thousand armed men, the Marshals of Louis XIV, and finally was only overcome by defection, treachery and death. What obscure man could, with such feeble means, attempt with more energy, a more gigantic effort? The insurrection, created by him, died with him ; he was its intellect,—its soul. But if he was the head, Cavalier was, so to speak, the arm and the most valiant sword. Roland had not that dash (élan), that adventurous, inspired impetuosity, that rash and chivalric bravery, which, added to the charms of youth, made Cavalier the most graceful and heroic figure of the desert. Roland, of a more mature age, a more manly character, had also more solid and more perfect characteristics. By nature possessing calmness united with passion, cunning with boldness, calculation with enthusiasm. A man of intellect, rather than action, he accepted, without seeking them, the combats which were necessary, leaving to Cavalier the glory of sterile and bloody assaults. His victories inspired, as it seemed, the young lieutenant with the culpable ambition of usurping the su preme command. Roland preserved this, and not only did not take revenge, but selected him as his means of communication with Villars, and, even after his defection, wished to reconcile him with his brigade. Cavalier appeared indispensable to his triumph. What a deplorable recompense for human actions: faithlessness conducted Cavalier to fortune and celebrity; Roland, incorruptible, sealing his cause with his blood, only obtained an obscure martydom."*

Had Roland lived, the insurrection might have attained its much desired end. Ravanel, Castanet and some others were arrested, April 18, 1705; the two were fastened back to back and burned alive. The insurrection was practically at an end.

The general communication of the tendency to prophecy seemed to depend on some general influence, which affected the whole protestant population at the same time. This was particularly to be noticed with reference to all those who belong to the Du Serre period. The prophets became strong powers when the theocratic army was organized. The Chiefs of this army were selected in accordance with the degree they were enjoying the communication of the spirit. But after the army was disbanded, certain of the prophets repaired to London (Jean Cavalier (de Sauve), Elie Marion and Durand Fage may here be mentioned), and excited much curiosity by their convulsions and extatic crises. Elie Marion founded a school of prophecy there. He was surrounded by a phalanx, divided into twelve tribes, after the manner of the Israelites. The English, however, being uneasy about this mystical religion, expelled them from the country.

Let us look upon this religious epidemic carefully, so as to see whether physiological and psychological laws will explain the extatic illuminism, which certainly existed in so wonderful a form. In the greater number of cases, it consisted in intermittent attacks, and, in the intervals, the mental and bodily health did not appear much injured.

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* Figuier. L'Histoire du Merveilleux. II, 389.

An attempt has been made to explain what the French call *theomanie extatique des calvinistes* by the supposition that hysteria or epilepsy were the causes. Figuier very properly thinks that neither affection will explain it, but that it was a disease sui generis. The facts seem to require such a conclusion.

The *crisis* came on as follows: after an exciting sermon, directing the mind to the persecution of the Church, the individual loosing consciousness of external objects, became a prey to high cerebral exaltation, At the end of a short time he fell to the ground, and was there seized with an epileptiform attack, the whole body was shaken and the muscles were convulsed. The convulsive agitations diminished, and then disappeared, being followed by calmness, when the individual arose and delivered his discourse, the burden of which was always the truths of the Protestant faith, the errors of Rome, and the re-establishment of their own churches. These discourses were delivered in the French of Languedoc, and began always with "*I tell thee, my child; I assure thee, my child.*" It was assumed that the Holy Spirit was really the speaker. When the discourse, was concluded, the prophet resumed his ordinary manner, rarely recollecting what he had said.

The extatic condition was sometimes excited by *insufflation* of a prophet. After he had finished his discourse, he approached the neophytes considered as fit candidates, breathed in the mouth of one and said, Receive the Holy Spirit. The novice went through the various stages, just described, and, after he had prophecied, breathed in turn in the mouth of another, and so the process went on, until all the chosen candidates were admitted. Often this condition of extatic convulsion was brought on a whole assembly, simply by an order or command from the prophet.

The incidents connected with the children attacked, show how the pliable thoughts of the young may be turned in any direction. "The sons and daughters of the Cevenese Protestants heard nothing but religious conversation, or biblical invocations destined to console them in their misfortunes as persecuted religionists. Hence the same ideas and words quite naturally proceeded from the mouths of these children when they were a prey to the *crises* raging in their country." The elegant language employed was simply that which they had heard from the prophets.

During the extatic crises, they were insensible to physical pain, exhibiting a similar condition to that found among the Jansenist convulsionnaires, and already mentioned in this article.

With all this, there was an epidemic character. Catholics were some times seized, and when they obeyed—their discourses were denunciatory of the mass : their children always spoke in the language of the prophets when they were seized. Protestants who desired the extacies of their brethren were seized in the same way. Many came to scoff and went away prophets.

Hallucinations were common. "In the belief that they were invulnerable, they precipitated themselves" into the midst of the fight. They saw the most celebrated martyrs of their faith, and heard delightful concerts in the air.

From all these facts the conclusion is drawn that "this was a special epidemic disease of the nervous system. The causes producing it were evidently the long sufferings and excess of misfortune to which the Protestants of the South were exposed for a long series of years. * * Despair excited the brain, and delirium with an epileptiform affection, was added to the other ills."

Considerable similarity is found between these and the actions of the Anabaptists of the 16th century, and much analogy with those convulsions of the Saint Medard Jansenists. We cannot deny the evidence furnished us in either case,—and where mere physiological explanations can satisfy our minds as to their cause, we have no need to admit the special miraculous character which has been accorded them. Such religious epidemics may be expected whenever the Church has become so cold and lifeless, as to leave absolute latitude to all, or so intolerant as to establish persecutions. We think illustrations of what we are stating could be found within the century now passing away. It would be a subject for astonishment, if a bird's eye view could be furnished of moral and religious epidemics, belonging to this century, but which have only differed from those referred to in this article, in degree but alas ! *not* in kind. To put this subject in its proper light would be doing a service to the age. Who will go forward in the path, so well-marked out by the author of the tract on the Anxious Bench ?

We had hoped to have noticed Figuier's article on *the divining rod*, but we must forbear. It may be that we shall take up that subject in another article. For the present we shall be content if our readers will have learned how "at different epochs almost identically the same diseases, delirium, and manifestations may occur, and how a superstitious spirit or a love of the marvellous will make haste to give them a supernatural character." The human race has always yearned for the supernatural. Says Bushnell, "Men can as well subsist in a vacuum, or on a metallic earth, attended by no vegetable or animal products, as they can stay content with mere cause and effect, and the endless cycle of nature. They may drive themselves into it, for the moment, by their speculations ; but the desert is too dry, and the air too thin—they cannot stay. Accordingly, we find that just now, when the propensities to mere naturalism are so manifold and eager, they are yet instigated in their eagerness itself by an impulse that scorns all the boundaries of mere knowledge and reason ; that is, by an appetite for things of faith, or a hope of yet fresher miracles and greater mysteries—gazing after the Boreal crown of Fourier, and the thawing out of the poles under the heat of so great felicity to come ; or watching at the gate of some third heaven to be opened by the magnetic passes, or the solemn incantations of the magic circles ; expecting an irruption of demons, in the name of science, more fantastic than even that which plagued the world in the days of Christ." A provision was made to satisfy this desire after the supernatural in the mysteries of the Christian faith, which are to be received *as* communicated, and not to be warped to suit our own purposes. St Paul's injunction is of value now, as well as eighteen hundred years ago: Prove all things; hold fast that which is *good.*

A

CATECHISM

OF

Christian Religion;

COMMONLY CALLED

THE

HEIDELBERG CATECHISM.

CHAMBERSBURG, PA.:
M. KIEFFER & CO'S. CALORIC PRINTING OFFICE.
1860.

PREFACE.

This English version of the Heidelberg Catechism is taken from "THE SUMME OF CHRISTIAN RELIGION: *delivered by Zacharias Ursinus in His Lectures upon the Catechisme, authorised by the noble Prince Fredericke throughout his dominions. Wherein are debated and resolved the Questions of whatsoever pointes of moment, which have beene or are controversed in Divinitie. Translated into English first by D. Henrie Parry, amd lately conferred with the last and best Latine Edition of D. David Pareus Professor of Divinity in Heidelberge. At Oxford, Printed by Joseph Barnes, and are to be sold in Paules Church-yard at the signe of the Bible.* 1601."

We are indebted, to the kindness of the Rt. Rev. W. R. Whittingham, for the opportunity of examining Wood's Athenae Oxonienses, where we find (Vol. I, 352) the following notice of Bishop Henry Parry, the translator of the Catechism.

HENRY PARRY, son of Henry Parry, son of Will. Parry of Wormebridge in Herefordshire Gent. was born in Wilts 20 Dec. or thereabouts an. 1561; admitted Scholar of Corpus Christi Coll. 13 Nov. 1576 and Probationer 23 Apr. 1586, being then Master of Arts. Afterwards he was Greek Reader in that Coll. Chaplain to Queen Elizabeth, Doctor of Divinity 1595, Dean of Chester in 1605 in the place of Dr. Will. Barlow promoted to the See of Rochester, and at length through Gloucester, was made Bishop of Worcester an. 1610. He was reputed by all of his time an able Divine, well read in the Fathers, a thoro-paced Disputant, and so eloquent a Preacher, that King James I always professed he seldom heard a better. The King of Denmark also, who was sometimes present at our King's Court, gave him a very rich ring for a Sermon that he Preached before him and King James at Rochester an. 1606. He hath published;

Concio de regno dei, in Matt. VI, 33. London 1606.

Concio de victoriâ Christiana in Apoc. III, 21. Oxon, 1593. Lond. 1606.

He also translated from English into Latin,

The summ of a Conference between Joh. Rainolds and Joh. Hart, touching the Head and Faith of the Church. Oxon, 1619.

Also from Latin into English,

A Catechism, wherein are debated and resolved the questions of whatsoever moment which have been, or are, controverted in Divinity. Oxon. 1591. Which Catechism was originally written by *Zach. Ursinus*

This worthy Bishop died of a Palsey at Worcester 12 Dec. in 1616 and was buried in a little Chappell joyning to the north side of the Door of the Cathedral Church at Worcester. In his Epitaph over his grave (a copy of which you may see in Hist. et Antiq. Univ. Oxon. lib. 2 p 238) he is characterized to be *trium linguarum cognitione, assidua verbi divini praedicatione, provida ecclesiae gubernatione, mentis pietate, morumque integritate spectatissimus*, &c.

L. H. S

Baltimore, December 12, 1860..

A CATECHISM

OF

Christian Religion.

Q. 1. What is thy only comfort in life and death.

A. That both in soul and body whether I live or die I am not mine own, but belong wholly unto my most faithful Lord and Saviour Jesus Christ, who by his precious blood most fully satisfying for all my sins, hath delivered me from all the power of the devil, and so preserveth me, that without the will of my heavenly Father not so much as a hair may fall from my head, yea all things must serve for my safety. Wherefore by his Spirit also he assureth me of everlasting life, and maketh me ready, and prepared, that henceforth I may live to him.

Q. 2. How many things are necessary for thee to know, that thou enjoying this comfort mayest live and die happily?

A. Three. The first, what is the greatness of my sin and misery. The second, how I am delivered from all sin and misery. The third, what thanks I owe unto God for this delivery.

The First General Part of Catechism touching THE MISERY OF MAN.

Q. 3. Whence knowest thou thy misery?

A. Out of the Law of God.

Q. 4. What doth the Law of God require of us?

A. That doth Christ summarily teach us, Matt. xxii, 37–40. Thou shalt love the Lord thy God with all thy heart, with all thy soul, with all thy mind, and with all thy strength. This is the first and the great Commandment, and the second is like unto this, Thou shalt love thy neighbor as thyself. On these two commandments hangeth the whole Law, and the Prophets.

Q. 5. Art thou able to keep all these things perfectly?

A. No truly. For by nature I am prone to the hatred of God, and of my neighbor.

Q. 6. Did God then make man so wicked and perverse?

A. Not so. But rather he made him good, and to his own Image, that is, endued with true righteousness and holiness, that he might rightly know God his Creator, and heartily love him, and live with him blessed for ever, and that to laud and magnify him.

Q. 7. Whence then ariseth this wickedness of man's nature?

A. From the fall and disobedience of our first parents, Adam and Eve; hence is our nature so corrupt, that we are all conceived, and born in sin.

Q. 8. Are we so corrupt that we are not at all apt to do well, and are prone to all vice?

A. Indeed we are: except we be regenerated by the Holy Ghost.

Q. 9. Doth not God then injury to man, who in the Law requireth that of him, which he is not able to perform?

A. No. For God had made man such a one, as he might perform it. But man by the impulsion of the Devil, and his own stubbornness, bereaved himself, and all his posterity of those divine graces.

Q. 10. Doth God leave this stubbornness and falling away of man unpunished?

A. No: but is angry in most dreadful manner, as well for the sins wherein we are born, as also for those which ourselves commit; and in most just judgment punisheth them with temporal and eternal punishments, as himself pronounceth; Cursed be he that confirmeth not all the words of this Law to do them.

Q. 11. Is not God therefore merciful?

A. Yea verily he is merciful, but so that he is also just; wherefore his justice requireth, that the same which is committed against the divine majesty of God, should also be recompensed with extreme, that is, everlasting punishments both of body and soul.

The Second Part.

OF MAN'S DELIVERY.

Q. 12. Seeing then by the just judgment of God, we are subject both to temporal and eternal punishments; is there yet any means or way remaining, whereby we may be delivered from these punishments, and be reconciled to God?

A. God will have his justice satisfied: wherefore it is necessary that we satisfy either by ourselves, or by another.

Q. 13. Are we able to satisfy by ourselves?

A. Not a whit. Nay rather we do every day increase our debt.

Q. 14. Is there any creature able in heaven or in earth, which is *only* a creature, to satisfy for us?

A. None. For first God will not punish that sin in any other creature, which man hath committed. And further, neither can that which is nothing but a creature, sustain the wrath of God against sin, and deliver others from it.

Q. 15. What manner of Mediator then and Deliverer must we seek for?

A. Such a one verily as is very man, and perfectly just, and yet in power above all creatures, that is, who also is very God.

Q. 16. Wherefore is it necessary that he be very man, and perfectly just too?

A. Because the justice of God requireth that the same human nature which hath sinned, do itself likewise make recompense for sin, but he that is himself a sinner, cannot make recompense for others.

Q. 17. Why must he also be very God?

A. That he might by his Godhead sustain in his flesh the burden of God's wrath, and might recover and restore unto us that righteousness and life which we lost.

Q. 18. And who is that Mediator which is together both very God, and a very perfectly just man?

A. Even our Lord Jesus Christ, who is made to us of God wisdom, righteousness, sanctification, and redemption.

Q. 19. Whence knowest thou this?

A. Out of the Gospel, which God first made known in

Paradise, and afterwards did spread it abroad by the Patriarchs and Prophets, shadowed it by sacrifices and other Ceremonies of the Law, and lastly accomplished it by his only begotten Son.

Q. 20. Is then salvation restored by Christ to all men, who perished in Adam?

A. Not to all: but to those only who by a true faith are engrafted into him, and receive his benefits.

Q. 21. What is true faith?

A. It is not only a certain knowledge, whereby I surely assent to all things which God hath revealed unto us in his word, but also an assured trust, kindled in my heart by the Holy Ghost, through the Gospel; whereby I make my repose in God, being assuredly resolved that remission of sins, everlasting righteousness, and life is given not to others only, but to me also, and that freely through the mercy of God, for the merit of Christ alone.

Q. 22. What are those things which are necessary for a Christian man to believe?

A. All things which are promised us in the Gospel; the sum whereof is briefly comprised in the Creed of the Apostles, or in the Articles of the Catholic and undoubted faith of all Christians.

Q. 23. Which is the Creed?

A. I believe in God the Father Almighty, Maker of heaven and earth:

2. And in Jesus Christ, his only son, our Lord:

3. Which was conceived by the Holy Ghost, born of the Virgin Mary:

4. Suffered under Pontius Pilate, was crucified, dead, and buried, he descended into hell:

5. The third day he rose again from the dead:

6. He ascended into heaven, and sitteth at the right hand of God the Father Almighty.

7. From thence shall he come to judge the quick and the dead.

8. I believe in the Holy Ghost.

9. I believe the holy Catholic Church, the communion of saints.

10. The forgiveness of sins.
11. The resurrection of the body.
12. And the life everlasting. Amen.

Q. 24. Into how many parts is this Creed divided?

A. Into three parts. The first is, of God the eternal Father, and our Creation. The second, of God the Son, and our Redemption. The third, of God the Holy Ghost, and our Sanctification.

Q. 25. Seeing there is but one only substance of God, why namest thou these three, the Father, the Son, and the Holy Ghost?

A. Because God hath so manifested himself in his word, that these three distinct persons are that one true and everlasting God.

Q. 26. What believest thou, when thou sayest, I believe in God the Father Almighty, Maker of heaven and earth?

A. I believe the everlasting Father of our Lord Jesus Christ, who hath made of nothing heaven and earth, with all that are in them, who likewise upholdeth and governeth the same by his eternal counsel and providence; to be my God and my Father for Christ's sake, and therefore I do trust in him, and so rely on him, that I may not doubt but he will provide all things necessary both for my soul and body. And further whatsoever evils he sendeth on me in this troublesome life, he will turn them to my safety, seeing both he is able to do it, as being God Almighty; and willing to do it, as being a bountiful father.

Q. 27. What is the providence of God?

A. The almighty power of God everywhere present, whereby he doth, as it were with his hand, uphold and govern heaven and earth, with all the creatures therein: so that those things which grow in the earth, as likewise rain and drought, fruitfulness and barrenness, meat and drink, health and sickness, riches and poverty, in a word, all things come not rashly or by chance, but by his fatherly counsel and will.

Q. 28. What doth this knowledge of the creation, and providence ot God profit us?

A. That in adversity we may be patient, and thankful in prosperity, and have hereafter our chiefest hope reposed in God our most faithful Father, being sure that there is nothing which may withdraw us from his love, forasmuch as all creatures are so in his power, that without his will they are not able not only to do anything, but not so much as once to move.

The Second Part of the Creed.

OF GOD THE SON, THE REDEEMER.

Q. 29. Why is the Son of God called Jesus, that is, a Saviour?

A. Because he saveth us from all our sins: neither ought any safety to be sought for from any other, nor can elsewhere be found.

Q. 30. Do they then believe in the only Saviour Jesus, who seek for happiness and safety of the Saints, or of themselves, or elsewhere?

A. No. For although in word they boast themselves of him as their Saviour, yet indeed they deny the only Saviour Jesus. For it must needs be that either Jesus is not a perfect Saviour, or that they who embrace him as their Saviour with a true faith possess all things in him, which are required unto salvation.

Q. 31. Why is he called Christ, that is, Anointed?

A. Because he was ordained of the Father, and anointed of the Holy Ghost, the chief Prophet and Doctor, who hath opened unto us the secret counsel, and all the will of his Father concerning our Redemption: And the High Priest, who with that one only sacrifice of his body hath redeemed us, and doth continually make intercession to his Father for us. And a King, who ruleth us by his word and spirit, and defendeth and maintaineth that salvation which he hath purchased for us.

Q. 32. But why art thou called a Christian?

A. Because through faith I am a member of Jesus Christ, and partaker of his anointing; that both I may confess his name, and present myself unto him a lively sacrifice of thankfulness, and also may in this life fight against sin and Satan with a free and good conscience, and afterward enjoy an everlasting kingdom with Christ over all creatures.

Q. 33. For what cause is Christ called the only-begotten Son of God, when we also are the sons of God?

A. Because Christ alone is the coeternal and natural Son of the eternal Father, and we are but sons adopted of the Father by grace for his sake.

Q. 34. Wherefore callest thou him our Lord?

A. Because he, redeeming and ransoming both our body and soul from sins, not with gold nor silver, but with his precious blood, and delivering us from all the power of the Devil, hath set us free to serve him.

Q. 35. What believest thou, when thou sayest, he was conceived by the Holy Ghost, and born of the Virgin Mary?

A. That the Son of God, who is, and continueth true and everlasting God, took the very nature of man, of the flesh and blood of the Virgin Mary, by the working of the Holy Ghost, that withal he might be the true seed of David, like unto his brethren in all things, sin excepted.

Q. 36. What profit takest thou by Christ's holy conception and nativity?

A. That he is our Mediator, and doth cover with his innocency and perfect holiness my sins, in which I was conceived, that they may not come in the sight of God.

Q. 37. What believest thou when thou sayest, He suffered?

A. That he all the time of his life which he led in the earth, but especially at the end thereof, sustained the wrath of God both in body and soul, against the sin of all mankind, that he might by his passion, as the only propitiatory sacrifice, deliver our body and soul from everlasting damnation and purchase unto us the favor of God, righteousness, and everlasting life.

Q. 38. For what cause should he suffer under Pilate as being his judge?

A. That he being innocent and condemned before a civil Judge, might deliver us from the severe judgment of God, which remained for all men,

Q. 39. But is there any thing more in it that he was fastened to the Cross, than if he had suffered any other kind of death?

A. There is more. For by this I am assured that he took upon himself the curse which did lie on me. For the death of the cross was accursed of God.

Q. 40. Why was it necessary for Christ to humble himself unto death?

A. Because the justice and truth of God could by no other means be satisfied for our sins, but by the very death of the Son of God.

Q. 41. To what end was he buried also?

A. That thereby he might make manifest that he was dead indeed.

Q. 42. But since that Christ died for us, why must we also die?

A. Our death is not a satisfaction for our sins, but the abolishing of sin, and our passage into life everlasting.

Q. 43. What other commodity receive we by the sacrifice and death of Christ?

A. That by the virtue of his death, our old man is crucified, slain, and buried together with him, that henceforth evil lusts and desires may not reign in us, but we may offer ourselves unto him a sacrifice of thanksgiving.

Q. 44. Why is there added, He descended into Hell?

A. That in my greatest pains, and most grievous tentations, I may support myself with this comfort, that my Lord Jesus Christ hath delivered me, by the unspeakable distresses, torments, and terrors of his soul, into which he was plunged both before, and then especially when he hanged on the cross, from the straits and torments of hell.

Q. 45. What doth the resurrection of Christ profit us?

A. First by his resurrection he vanquished death, that he might make us partakers of that righteousness which he had gotten us by his death. Again we are now also stirred up by his power to a new life. Lastly, the resurrection of our head Christ, is a pledge unto us of our glorious resurrection.

Q. 46. How understand you that, He ascended into heaven?

A. That Christ, his disciples looking on, was taken up from the earth into heaven, and yet still is there for our sakes, and will be, until he come again to judge the quick and dead.

Q. 47. Is not Christ with us then until the end of the world as he hath promised?

A. Christ is true God, and true man: and so according to his manhood, he is not now on earth: but according to his godhead, his majesty, his grace, and spirit, he is at no time from us.

Q. 48. Are not by this means the two natures in Christ pulled asunder, if his humanity be not wheresoever his divinity is?

A. No: For seeing his Divinity is incomprehensible, and everywhere present, it followeth necessarily that the same is without the bounds of his human nature which he took to him, and yet is nevertheless in it, and abideth personally united to it.

Q. 49. What fruit doth the ascension of Christ into heaven bring us?

A. First, that he maketh intercession to his Father in heaven for us. Next that we have our flesh in heaven, that we may be confirmed thereby, as by a sure pledge, that it shall come to pass, that he who is our head, will lift up us his members unto him. Thirdly that he sendeth us his spirit instead of a pledge between him and us, by whose forcible working we seek after, not earthly, but heavenly things, where he himself is sitting at the right hand of God.

Q. 50. Why is it further said, He sitteth at the right hand of God?

A. Because Christ therefore is ascended into heaven, to show there that he is the Head of the Church, by whom the Father governeth all things.

Q. 51. What profit is this glory of our Head, Christ, unto us?

A. First, that through his Holy Spirit, he poureth upon us his members, heavenly graces. Then that he shieldeth and defendeth us by his power against all our enemies.

Q. 52. What comfort hast thou by the coming again of Christ to judge the quick and the dead?

A. That in all my miseries and persecutions I look with my head lifted up, for the very same, who before yielded himself unto the judgment of God for me, and took away all malediction from me, to come Judge from heaven, to throw all his and my enemies into everlasting pains, but to translate me with all his chosen, unto himself, into celestial joys and everlasting glory.

Q. 53. What believest thou concerning the Holy Ghost?

A. First, that he is true and coeternal God with the eternal Father and the Son: Secondly, that he is also given to me, to make me through a true faith partaker of Christ and all his benefits, to comfort me, and to abide with me for ever.

Q. 54. What believest thou concerning the holy and catholic Church of Christ?

A. I believe that the Son of God doth from the beginning of the world to the end, gather, defend, and preserve unto himself by his Spirit and word, out of whole mankind a company chosen to everlasting life, and agreeing in true faith: and that I am a lively member of that company, and so shall remain for ever.

Q. 55. What mean these words, The communion of Saints?

A. First that all and every one, who believeth, are in common partakers of Christ and all his graces, as being his members. And then, that every one ought readily and cheerfully to bestow the gifts and graces which they have received, to the common commodity and safety of all.

Q. 56. What believest thou concerning remission of sins?

A. That God for the satisfaction made by Christ, hath put out all the remembrance of my sins, and also of that corruption within me, wherewith I must fight all my life time, and doth freely endow me with the righteousness of Christ, that I come not at any time into judgment.

Q. 57. What comfort hast thou by the resurrection of the flesh?

A. That not only my soul, after it shall depart out of my body, shall presently be taken up to Christ her head, but that this my flesh also, being raised up by the power of Christ, shall be again united to my soul, and shall be made like to the glorious body of Christ.

Q. 58. What comfort takest thou of the Article of everlasting life?

A. That forasmuch as I feel already in my heart the beginning of everlasting life, it shall at length come to pass, that after this life I shall enjoy full and perfect bliss, wherein I may magnify God for ever; which blessedness verily, neither eye hath seen, nor ear hath heard, neither hath any man in thought conceived it.

Q. 59. But when thou believest all these things, what profit redoundeth thence unto thee?

A. That I am righteous in Christ before God, and an heir of eternal life.

Q. 60. How art thou righteous before God?

A. Only by faith in Christ Jesus: so that, although my conscience accuse me, that I have grievously trespassed against all the commandments of God, and have not kept one of them: and further am as yet prone to all evil: yet notwithstanding (if I embrace these benefits of Christ with a true confidence and persuasion of mind) the full and perfect satisfaction, righteousness and holiness of Christ, without any merit of mine, of the mere mercy of God, is imputed and given unto me, and that so as if I neither had committed any sin, neither any corruption did stick unto me, yea as if I myself had perfectly accomplished that obedience, which Christ accomplished for me.

Q. 61. Why affirmest thou, that thou art made righteous by faith only?

A. Not for that I please God through the worthiness of mere faith, but because only the satisfaction, righteousness, and holiness of Christ is my righteousness before God: and I cannot take hold of it, or apply it unto myself any other way than by faith.

Q. 62. Why cannot our good works be righteousness, or some part of righteousness before God?

A. Because that righteousness, which must stand fast before the judgment of God, must be in all points perfect, and agreeable to the law of God. Now our works, even the best of them, are imperfect in this life, and defiled with sin.

Q. 63. How is it that our good works merit nothing, seeing God promiseth that he will give a reward for them, both in this life and in the life to come?

A. That reward is not given of merit, but of grace.

Q. 64. But doth not this doctrine make men careless and profane?

A. No. For neither can it be, but they which are incorporated into Christ through faith, should bring forth the fruits of thankfulness.

OF THE SACRAMENTS.

Q. 65. Seeing then that only faith maketh us partakers of Christ and his benefits, whence doth it proceed?

A. From the Holy Ghost, who kindleth it in our hearts by the preaching of the Gospel, and confirmeth it by the use of the Sacraments.

Q. 66. What are the Sacraments?

A. They are sacred signs and seals set before our eyes, and ordained of God for this cause, that he may declare and seal by them the promise of his Gospel unto us, to wit, that he giveth freely remission of sins, and life everlasting not only to all in general, but to every one in particular that believeth, for that only sacrifice of Christ, which he accomplished upon the cross.

Q. 67. Do not then both the Word and Sacraments tend to that end, as to lead our faith unto the sacrifice of Christ finished on the Cross, as to the only ground of our salvation?

A. It is even so. For the Holy Ghost teacheth us by the Gospel, and assureth us by the Sacraments, that the salvation of all of us standeth in the only sacrifice of Christ offered for us upon the cross.

Q. 68. How many Sacraments hath Christ ordained in the New Testament?

A. Two. Baptism, and the Holy Supper.

OF BAPTISM.

Q. 69. How art thou admonished and assured in Baptism, that thou art partaker of the only sacrifice of Christ?

A. Because CHRIST commanded the outward washing of water, adjoining this promise thereunto, that I am no less assuredly washed by his blood and spirit from the uncleanness of my soul, that is, from all my sins, than I am washed outwardly with water, whereby all the filthiness of the body useth to be purged.

Q. 70. What is it to be washed with the blood and spirit of Christ?

A. It is to receive of God forgiveness of sins freely, for the blood of Christ, which he shed for us in his sacrifice on the Cross. And also to be renewed by the Holy Ghost, and through his sanctifying of us, to become members of Christ, that we may more and more die to sin, and live holy, and without blame.

Q. 71. Where doth Christ promise us that he will as certainly wash us with his blood and spirit, as we are washed with the water of Baptism?

A. In the institution of Baptism; the words whereof are these: *Go and teach all nations, baptizing them in the name of the Father, the Son, and the Holy Ghost. He that shall believe, and be baptized, shall be saved: but he that will not believe shall be damned.* This promise is repeated again, whereas the Scripture calleth Baptism, the washing of the new birth, and forgiveness of sins.

Q. 72. Is then the outward Baptism of water the washing away of sins?

A. It is not. For the blood of Christ alone cleanseth us from all sin.

Q. 73. Why then doth the Holy Ghost call Baptism the washing of the new birth, and forgiveness of sins?

A. God speaketh so not without great cause: to wit, not only to teach us, that as the filth of our body is purged by water, so our sins also are purged by the blood and spirit of Christ: but much more to assure us by this divine token and pledge, that we are as verily washed from our sins with the inward washing, as we are washed by the outward and visible water.

Q. 74. Are infants to be baptized also?

A. What else? For seeing they belong as well unto the covenant and church of God, as they who are of a full age; and seeing also unto them is promised remission of sins by the blood of Christ, and the Holy Ghost the worker of faith, as well as unto those of full growth, they are by Baptism to be ingrafted into the church of God, and to be discerned from the children of infidels, in like sort as in the Old Testament was done by circumcision, in place whereof is Baptism succeeded in the New Testament.

OF THE LORD'S SUPPER.

Q. 75. How art thou in the Lord's Supper admonished and warranted, that thou art partaker of that only sacrifice of Christ offered on the Cross, and of his benefits?

A. Because Christ hath commanded me and all the faithful to eat of this bread broken, and to drink of the cup distributed, in remembrance of him, with this promise adjoined. First, that his body was as certainly broken and offered for me on the Cross, and his blood shed for me, as I behold with my eyes the bread of the Lord broken unto me, and the cup communicated to me; and further, that my soul is no less assuredly fed to everlasting life with his body, which was crucified for us, and his blood, which was shed for us, than I receive and taste by the mouth of my body the bread and wine, the signs of the body and blood of our Lord, received at the hand of the Minister.

Q. 76. What is it to eat the body of Christ crucified, and to drink of his blood that was shed?

A. It is not only to embrace by an assured confidence of mind the whole passion and death of Christ, and thereby to obtain forgiveness of sins and everlasting life: but also by the Holy Ghost, who dwelleth both in Christ and us, so more and more to be united to his sacred body, that though he be in heaven, and we in earth, yet nevertheless are we flesh of his flesh, and bone of his bones: and as all the members of the body are by one soul, so are we also quickened and guided by one and the same Spirit.

Q. 77. Where hath Christ promised, that he will as certainly give his body and blood so to be eaten and drunken, as they eat this bread broken, and drink this cup?

A. In the institution of his Supper, the words whereof are these: *Our Lord Jesus Christ, in the night that he was betrayed, took bread: and when he had given thanks, he brake it, and said, Take, eat, This is my body which is broken for you: this do you in remembrance of me. Likewise also he took the cup, when he had supped, and said, This cup is the new Testament in my blood: this do, as often as ye shall drink it, in remembrance of me. For as often as ye shall eat this bread, and drink this cup, ye shew the Lord's death till he come.* This promise is repeated by St. Paul, when he sayeth: *The cup of thanksgiving, wherewith we give thanks, is it not the communion of the blood of Christ? For we that are many, are one bread and one body, because we all are partakers of one bread.*

Q. 78. Are then the bread and wine, made the very body and blood of Christ?

A. No verily. But as the water of Baptism is not turned into the blood of Christ, but is only a sign and pledge of those things that are sealed to us in Baptism: so neither is the bread of the Lord's Supper the very body of Christ: Although according to the manner of Sacraments, and that form of speaking of them, which is usual unto the Holy Ghost, the bread is called the body of Christ.

Q. 79. Why then doth Christ call the bread his body, and the cup his blood, or the new Testament in his blood: and Paul also calleth bread and wine, the communion of the body and blood of Christ?

A. Christ not without great consideration speaketh so: to wit, not only for to teach us, that as the bread and wine sustain the life of the body, so also his crucified body, and blood shed, are indeed the meat and drink of our soul, whereby it is nourished to eternal life: But much more, that by this visible sign and pledge he may assure us, that we are as verily partakers of his body and blood through the working of the Holy Ghost, as we do receive by the mouth of our body these holy signs in remembrance of him and further also, that that his suffering and obedience is so certainly ours, as though we ourselves had suffered punishments for our sins, and had satisfied God.

Q. 80. What difference is there between the Lord's Supper and the Popish Mass?

A. The supper of the Lord testifieth to us that we have perfect forgiveness of all our sins for that only sacrifice of Christ, which himself once fully wrought on the Cross: Then also that we by the Holy Ghost are grafted into Christ, who now according to his human nature is only in heaven at the right hand of his Father, and there will be worshipped of us. But in the Mass it is denied, that the quick and the dead have remission of sins for the only passion of Christ; except also Christ be daily offered of them by their sacrificers. Farther also it is taught, that Christ is bodily under the forms of bread and wine, and therefore is to be worshipped in them : And so the very foundation of the Mass is nothing else than an utter denial of that only sacrifice and passion of Christ Jesus, and an accursed idolatry.

Q. 81. Who are to come unto the table of the Lord?

A. They only who are truly sorrowful, that they have offended God by their sins; and yet trust that those sins are pardoned them for Christ's sake : and what other infirmity they have, that those are covered by his passion and death, who also desire more and more to go forward in faith and integrity of life : But hypocrites, and they who do not truly repent, do eat and drink damnation to themselves.

Q. 82. Are they also to be admitted to this Supper, who in confession and life declare themselves to be infidels and ungodly?

A. No. For by that means the covenant of God is profaned, and the wrath of God is stirred up against the whole assembly, wherefore the Church by the commandment of Christ and his Apostles, using the keys of the kingdom of heaven, ought to drive them from this Supper, till they shall repent and change their manners.

Q. 83. What are the keys of the kingdom of heaven?

A. Preaching of the Gospel, and Ecclesiastical discipline: by which heaven is opened to the believers, and is shut against the unbelievers.

Q. 84. How is the kingdom of heaven opened and shut by the preaching of the Gospel?

A. When by the commandment of Christ it is publicly declared to all and every one of the faithful, that all their sins are pardoned them of God, for the merit of Christ, so often as they embrace by a lively faith the promise of the Gospel : but contrarily is denounced to all Infidels and Hypocrites, that so long the wrath of God and everlasting damnation doth lie on them, as they persist in their wickedness : according to which testimony of the Gospel, God will judge them, as well in this life, as in the life to come.

Q. 85. How is the kingdom of heaven opened and shut by Ecclesiastical discipline?

A. When according to the commandment of Christ, they who in name are Christians, but in their doctrine and life shew themselves aliens from Christ, after they having been some time admonished, will not depart from their errors or wickedness, are made known unto the Church, or to them that are appointed for that matter and purpose, of the Church; and if neither then they obey their admonition, are of the same men by interdiction from the Sacraments shut out from the Congregation of the Church, and by God himself, out of the kingdom of heaven. And again, if they profess and indeed declare amendment of life, are received as members of Christ and his Church.

The Third Part.

OF MAN'S THANKFULNESS.

Q. 86. When as we are delivered from all our sins and miseries without any merit of ours, by the mercy of God only for Christ's sake, for what cause are we to do good works?

A. Because, after that Christ hath redeemed us with his blood, he reneweth us also by his Spirit to the image of himself: that we receiving so great benefits should shew ourselves all our lifetime thankful to God, and honor him. Secondly that every of us may be assured of his faith, by his fruit; And lastly, by our honest and good conversation, may win others unto Christ.

Q. 87. Cannot they then be saved, which be unthankful, and remain still carelessly in their sins, and are not converted from their wickedness unto God?

A. By no means. For as the Scripture beareth witness, neither unchaste persons, nor idolaters, nor adulterers, nor thieves, nor covetous men, nor drunkards, nor slanderers, nor robbers, shall inherit the kingdom of God.

Q. 88. Of what parts consisteth the conversion of men unto God?

A. It consisteth of the mortifying of the old man, and the quickening of the new man.

Q. 89. What is the mortifying of the old man?

A. To be truly and heartily sorry, that thou hast offended God by thy sins, and daily more and more to hate and eschew them.

Q. 90. What is the quickening of the new man?

A. True joy in God through Christ, and an earnest and ready desire to order thy life according to God's will, and to do all good works.

Q. 91. What are good works?

A. Those only which are done by a true faith, according to God's law, and are referred only to his glory: and not those which are imagined by us, as seeming to us to be right and good, or which are delivered and commanded by men.

Q. 92. Which is the Law of God?

A. God spake all these words:

1. I am the Lord thy God, which hath brought thee out of Egypt, out of the house of bondage, thou shalt have no other Gods in my sight.

2. Thou shalt make to thee no graven Image, nor the likeness of anything that is in heaven above, or in the earth beneath, or in the water under the earth. Thou shalt not bow down to them, nor worship them: for I the Lord thy God, am a jealous God, and visit the sins of the fathers upon the children, unto the third and fourth generation of them that hate me, and shew mercy unto thousands of them that love me, and keep my commandments.

3. Thou shalt not take the name of the Lord thy God in vain: for the Lord will not hold him guiltless that taketh his name in vain.

4. Remember thou keep holy the Sabbath day, six days shalt thou labor and do all that thou hast to do, but the seventh day is the Sabbath of the Lord thy God: in it thou shalt do no manner of works, thou, and thy son and thy daughter, thy man servant, and thy maid servant, thy cattle, and the stranger that is within thy gate. For in six days the Lord made heaven and earth, the sea and all that in them is, and rested the seventh day: wherefore the Lord blessed the seventh day and hallowed it.

5. Honor thy father and thy mother, that thy days may be long in the land, which the Lord thy God giveth thee.

6. Thou shalt do no murder.

7. Thou shalt not commit adultery.

8. Thou shalt not steal.

9. Thou shalt not bear false witness against thy neighbor.

10. Thou shalt not covet thy neighbor's house, nor his wife, nor his servant, nor his maid, nor his ox, nor his ass, nor any thing that is his.

Q. 93. How are the commandments divided?

A. Into two Tables: whereof the former delivereth in four commandments, how we ought to behave ourselves towards God: the latter delivereth in six commandments, what duties we owe unto our neighbor.

Q. 94. What doth God require in the first commandment?

A. That, as dearly as I tender the salvation of my own soul, so earnestly should I shun and fly all Idolatry, sorcery, enchantments, superstition, prayer to Saints, or any other creatures, and should rightly acknowledge the only and true God, trust in him alone, submit and subject myself unto him with all humility and patience, look for all good things from him alone, and lastly with the entire affection of my heart love, reverence, and worship him: so that I am ready to renounce and forsake all creatures rather than to commit the least thing that may be against his will.

Q. 95. What is Idolatry?

A. It is in place of that one God, or besides that one and true God, who hath manifested himself in his word, to make, or imagine, and account any other thing, wherein thou reposest thy hope and confidence.

Q. 96. What doth the second commandment require?

A. That we should not express or represent God by any image, or shape, and figure or worship any otherwise than he hath commanded in his word himself to be worshiped.

Q. 97. May there then at all any Images or resemblances of things be made?

A. God neither ought nor can be represented by any means, and for the creatures, although it be lawful to express them, yet God forbiddeth notwithstanding their images to be made or had, as thereby to worship or honor either them, or God by them.

Q. 98. But may not images be tolerated in Churches, which may serve for the use of the common people?

A. No. For it is not seemly that we should be wiser than God, who will have his Church to be taught with the lively preaching of his word, and not with dumb images.

Q. 99. What doth God decree in the third commandment?

A. That not only by cursing, or forswearing, but also by rash swearing, we should not use his name despitefully or unreverently: neither should by silence or connivance be partakers of those horrible sins in others: but that we use the sacred and holy name of God ever with great devotion and reverence: that he may be worshiped and honored by us with a true and constant confession, and invocation of his name, and lastly in all our words and actions whatsoever.

Q. 100. Is it then so grievous a sin by swearing, or banning, to take the name of God in vain, as that God is also angry with them, who, as much as in them lieth, do not forbid or hinder it?

A. Surely most grievous. For neither is there any sin greater, or more offending God, than the despiting of his sacred name. Wherefore also he would have this sin to be punished with death.

Q. 101. May a man swear also religiously and lawfully by the name of God?

A. He may: when as either the Magistrate exacteth it, or otherwise necessity requireth by this means the faith and truth of any man or thing to be ratified and established whereby both the glory of God may be advanced, and the safety of others procured. For this kind of swearing is ordained by God's word, and therefore was well used of the Fathers both in the old, and new Testament.

Q. 102. Is it lawful to swear by Saints or other creatures?

A. No. For a lawful oath is an invocation of God, whereby we desire, that he, as the only searcher of hearts, bear witness unto the truth, and punish the swearer, if he wittingly swear falsely. But this honor agreeth to no creature.

Q. 103. What doth God command in the fourth commandment?

A. First that the ministry of the Gospel, and the schools of learning should be maintained: and that I, both at other times, and especially on holy-days, should frequent studiously divine assemblies, hear the word of God diligently, use the Sacraments, join my prayers with the common prayers of the assembly, and bestow something, according to my ability, on the poor. And further, that all my life time I be free from misdeeds and evil actions, yielding unto the Lord, that he may by his Holy Spirit work in me his work, and so I may begin in this life that everlasting Sabbath.

Q. 104. What doth God injoin us in the fifth commandment?

A. That we yield due honor, love and faithfulness to our Parents, and so to all, who bear rule over us, and submit ourselves with such obedience, as is meet, to their faithful commandments and chastisements: And further also, that by our patience we bear and suffer their vices and manners, ever thinking with ourselves that God will govern and guide us by their hand.

Q. 105. What doth God exact in the sixth commandment?

A. That neither in thought, nor in gesture, much less in deed, I reproach, hate, or harm, or kill my neighbor, either by myself, or by another: but I cast away all desire of revenge. Furthermore, that I hurt not myself, or cast myself wittingly into any danger. Wherefore also that murders might not be committed, he hath armed the Magistrate with the sword.

Q. 106. But this commandment seemeth to forbid murder only.

A. But in forbidding murder, God doth further teach that he hateth the root and cause of murder, to wit, envy, hatred, and desire of revenge, and doth account them all for murder.

Q. 107. Is it enough that we kill no man in such sort as hath been said?

A. It is not enough. For when God condemneth anger, envy, hatred, he requireth that we love our neighbor as ourselves: and that we use humanity, lenity, courtesy, patience, and mercy towards him, and turn away from him, as much as we may, whatsoever may be hurtful unto him: In a word, that we be so affected in mind, as that we stick not to do good also unto our enemies.

Q. 108. What is the meaning of the seventh commandment?

A. That God hath in execration all turpitude and filthiness, and therefore we also must utterly hate and detest it, and contrariwise live temperately, modestly, and chastely, whether we live in holy wedlock, or in single life.

Q. 109. Forbiddeth God nothing else in this commandment, but adultery, and such kinds of uncleanness?

A. Seeing both our body and soul are the Temples of the Holy Ghost, God will have us to possess both in purity and holiness. And therefore deeds, gestures, words, thoughts, filthy lusts, and whatsoever enticeth a man unto these, all that he wholly forbiddeth.

Q. 110. What doth God forbid in the eighth commandment?

A. Not only those thefts, and robberies, which the Magistrate punisheth; but by the name of theft he comprehendeth whatsoever evil crafts, fetches, and devices, whereby we seek after other men's goods, and endeavor by force, or with some shew of right to convey them over unto ourselves: of which sort are, false weights, false ells, uneven measures, deceitful merchandize, counterfeit coin, usury, or any other way or means of furthering our estate, which God hath forbidden. To these we may add all covetousness, and the manifold waste and abusing of God's gifts.

Q. 111. What are those things which God here commandeth?

A. That to my power I help and further the commodities and profit of my neighbor: and that I so deal with him, as I would desire to be dealt with myself: and that I do my own work painfully, and faithfully, that I may thereby help others also who are distressed with any need or calamity.

Q. 112. What doth the ninth commandment exact?

A. That I bear no false witness against any man, neither falsify any man's words, neither backbite or reproach any man, nor condemn any man rashly or unheard; but avoid and shun with all carefulness all kind of lies, and deceit, as the proper works of the Devil, except I mean to stir up against me the most grievous wrath of God: And that in judgments and other affairs I follow the truth, and freely and constantly profess the matter as it indeed is: And moreover defend and encrease, as much as in me lieth, the good name and estimation of others.

Q. 113. What doth the tenth commandment forbid?

A. That our hearts be not at any time moved by the least desire, or cogitation against any commandment of God; but that continually, and from our heart we detest all sin, and contrarily delight in all righteousness.

Q. 114. But can they, who are converted unto God, perfectly observe and keep these commandments?

A. No: But even the holiest of men as long as they live have only small beginnings of this obedience: yet so that they begin with an earnest and unfeigned desire and endeavor to live not according to some only, but according to all the commandments of God.

Q. 115. Why will God then have his law to be so exactly and severely preached, seeing there is no man in this life, who is able to keep it?

A. First that all our lifetime we more and more acknowledge the great proneness of our nature to sin, and so much the more greedily desire remission of sins and righteousness in Christ: Secondly, that we being doing of this always, and always thinking of that, implore and crave of the Father the grace of his Holy Spirit, whereby we may daily more and more be renewed to the image and likeness of God, until at length after we are departed out of this life, we may joyfully attain unto that perfection which is proposed unto us.

OF PRAYER.

Q. 116. Wherefore is prayer necessary for Christians?

A. Because it is the chief part of that thankfulness which God requireth of us. And also because God giveth them only his grace and Holy Spirit, who with unfeigned groanings beg them continually of him, and yield him thanks for them.

Q. 117. What is required unto that prayer, which shall please God, and be heard of him?

A. That we ask of the only true God, who hath manifested himself in his word, all things, which he hath commanded to be asked of him, with a true affection and desire of our heart, and, through an inward feeling of our need and misery, cast ourselves down prostrate in the presence of his divine Majesty, and build ourselves on this sure foundation, that we, though unworthy, yet for Christ's sake are certainly heard of God, even as he hath promised us in his word.

Q. 118. What are those things which he commandeth us to ask of him?

A. All things necessary both for soul and body; which our Lord Jesus Christ hath comprised in that prayer which himself hath taught us.

Q. 119. What prayer is that?

A. Our Father, which art in heaven: Hallowed be thy name: Thy kingdom come: Thy will be done in earth as it is in heaven: Give us this day our daily bread: And forgive us our trespasses, as we forgive them that trespass against us: And lead us not into temptation, but deliver us from evil; For thine is the kingdom, the power, and the glory, for ever, and ever: Amen.

120. Q. Why doth Christ teach us to call God our Father?

A. That presently in the very entrance and beginning of the prayer, he might stir up in us such a reverence and confidence in God, as is meet for the sons of God; which must be the ground and foundation of our prayer: to wit, that God through Christ is made our Father, and will much less deny unto us those things, which we ask of him with a true faith, than our earthly Parents deny unto us earthly things.

Q. 121. Why is that added: which art in heaven?

A. That we conceive not basely or terrenely of God's heavenly majesty: And also that we look for and expect from his Omnipotency, whatsoever things are necessary for our soul and body.

Q. 122. What is the first petition?

A. Hallowed be thy name: that is, Grant us first to know thee aright, and to worship, praise, and magnify thy almightiness, goodness, justice, mercy, and truth, shining in all thy works. And further also to direct our whole life, thoughts, words, and works to this end, that thy most holy name be not reproached for us, but rather be renowned with honor and praises.

Q. 123. What is the second petition?

A. Let thy kingdom come: that is, rule us so by thy word and Spirit, that we may humble and submit ourselves more and more unto thee. Preserve and encrease thy Church, destroy the works of the Devil and all power that lifteth up itself against thy Majesty: make all those counsels frustrate and void, which are taken against thy word, until at length thou reign fully and perfectly, when thou shalt be all in all.

Q. 124. What is the third petition?

A. Thy will be done in earth as it is in heaven: that is, grant that we and all men, renouncing and forsaking our own will, may readily and without any grudging obey thy will, which only is holy: and that so every of us may faithfully and cheerfully perform that duty and charge which thou hast committed unto us, even as the blessed Angels do in heaven.

Q. 125. What is the fourth petition?

A. Give us this day our daily bread: that is, give unto us all things, which are needful for this life, that by them we may acknowledge and confess thee to be the only fountain, from whence all good things flow, and all our care and industry, and even thine own gifts to be unfortunate and noisome unto us, except thou bless them, wherefore grant that turning our trust away from all creatures, we place and repose it in thee alone.

Q. 126. What is the fifth petition?

A. Forgive us our trespasses, as we forgive them that trespass against us: that is, Even for the blood of Christ do not impute unto us most miserable and wretched sinners all our offences, neither that corruption which still cleaveth unto us: even as we also feel this testimony of thy grace in our hearts, that we steadfastly purpose unfeignedly from our heart to pardon and forgive all those, who have offended us.

Q. 127. What is the sixth petition?

A. Lead us not into temptation, but deliver us from evil : that is, because we ourselves are so feeble and weak by nature, that we cannot stand so much as one moment or instant, and our most deadly enemies, Satan, the world, and our own flesh, do instantly oppugn and assault us : uphold thou us, and establish and strengthen us by the might of thy Spirit, that we may not in this spiritual combat yield as vanquished, but may so long stoutly withstand them, until at length we get full and perfect victory.

Q. 128. How concludest thou this prayer?

A. For thine is the kingdom, the power, and the glory, for ever : that is, we ask and crave all things of thee, because, seeing both thou art our king, and Almighty, thou art both willing and able to give them all unto us. And these things we therefore ask, that out of them, not to us, but unto Thy holy name all glory may redound.

Q. 129. What meaneth this particle, Amen?

A. That the thing is sure and out of doubt; For my prayer is much more certainly heard of God, than I feel in my heart, that I unfeignedly desire the same.

Soli Deo Laus et Gloria.

PROCEEDINGS

OF THE

General Meeting of the Medical Profession,

IN RELATION TO THE DEATHS OF

CHARLES FRICK, M.D.

Professor of Materia Medica and Therapeutics in the University of Maryland;

AND

BERWICK B. SMITH, M.D.

Demonstrator of Anatomy in the University of Maryland:

Held Thursday, March 29th, 1860.

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1860.

PROCEEDINGS.

Pursuant to a call in the public papers, a large meeting of the members of the *Medical Profession* was held on Thursday night, March 29th, 1860, at the Rooms of the Medical and Chirurgical Faculty, No. 47 North Calvert street.

Dr. John F. Monmonier opened the meeting by saying, that, as the Executive Committee of the Faculty had been active in calling the meeting, it would be well to state the objects for which it was convened. A portion of the Medical Profession,—members of the societies,—had already expressed their sorrow at the death of Prof. CHARLES FRICK, but this meeting was called for the purpose of giving a more general expression by the Profession. He moved that Dr. Alex. C. Robinson be called to the chair. The motion was unanimously carried.

Dr. W. Chew Van Bibber was chosen Secretary.

Dr. Robinson, on taking the chair, expressed himself as follows:

Gentlemen:—In complying with your request to occupy the chair this evening, I recognize those around me far better prepared by experience to discharge its duties,—but no one, more touched by the sad event, which has called us together. Need I announce the purpose of this gathering? Need I repeat what has been echoed along the avenues, and through the homes of our city? Need I tell you whom we mourn?—That we are here to speak to each other of our sorrow at the death of Dr. CHARLES FRICK—snatched from our midst in the full vigor of manhood, activity and usefulness. "Know ye not, that there is a Prince, and a great man fallen this day in Israel!" Although it is with the living, and not the dead, that we, as professional men, have to do,—yet when death comes so unexpectedly and occupies the chambers, which but yesterday breathed the breath of life,—stopping the throbbings of those avenues along which the warm blood so strongly coursed,—rendering those chords irresponsive, which never before ceased to vibrate to affection, to duty, and to intelligence,—it is fitting and natural, that we should gather together, and tell of our affection,—of our admiration,—of our disappointment, and of our sorrow, at the loss of such a professional colleague and brother.

Why, gentlemen, scarcely had CHARLES FRICK returned from the newly made grave of a valued professional associate (Dr. BERWICK B. SMITH), before he heard the summons—"Behold the feet of them which have buried thy brother are at the door, and shall carry thee out." This solemnly sudden summons came to him in early manhood,—the morning dew still resting on the fresh chaplet, so recently placed upon his brow. Indeed to those familiar with his strength and fitness, Professor FRICK had hardly fully equipped himself for his duties, when called from life into eternity by an inscrutable but all-wise Providence. We intrude not upon the once bright, but now desolate home, and hearts that loved him most, because they knew him best,—we dwell not on the blighted prospects of distinguished usefulness for which he was so happily maturing,—

but missing the frank smile of that well known face, and the kindly pressure of that warm hand,—we irresistibly gathered around his grave, and have now gathered here to speak of the worth of the departed physician and man. We are not here to eulogise the dead,—but to speak the truth of one we knew and loved.

When the soldier dies, his burial is told by the muffled drum and minute guns, which sound his requiem. That over, the trumpet's voice is heard to break the stillness of the scene;—the quickened tread of returning columns, and the martial music, floating from rank to rank, breathe oblivion o'er the soldier's fall, and speak forgetfulness of grief; all, all is soon again life and motion, which dream not of him, who lies buried "with his martial cloak around him."

It is not *thus* when one is struck down on the *field of science.* The ranks are not so full of leaders. No advancing column comes ready to fill the gap. Candidates slowly present themselves, to supply the vacant place. It must be long before that place can be filled in our hearts, or in our professional ranks, left vacant by the death of Prof. CHARLES FRICK. But I leave to others to depict, appropriately, the worth and virtues of our departed friend, and embody your grief in fitting words. Merely intending thus to announce the purpose of this meeting, I could not say less of one, whose devotion to his duties as a pupil of the Baltimore Alms House, I well remember while physician of that institution in 1845-46,—where I found young FRICK a student,—commanding the affection of his fellow-students and all associated with him, as well as the gratitude of the poor inmates of the wards, to whom he was ever faithful and ever kind. He there gained my affection; and I observed his subsequent professional distinction with gratified feelings, knowing that he truly merited all he so fairly won, and modestly wore.

Dr. Christopher Johnston moved that a committee of three be appointed to draft resolutions to express the sense of the meeting. Adopted.

The Chair appointed Drs. Christopher Johnston, Jas. Bordley, and Louis H. Steiner.

Dr. Wm. M. Kemp moved that the same committee be requested to express the sentiments of the meeting in regard to the death of Dr. Berwick B. Smith. Adopted.

The committee retired, and returned in a few minutes with their resolutions.

Dr. Johnston, the Chairman, in presenting them, said:

Mr. President, and Gentlemen of the Medical Profession:—In presenting the resolutions prepared at your request for action this evening, your committee beg leave to make a few remarks upon the saddest occasion which has ever brought us together. And this we do with the more earnestness since most of us enjoyed the privilege of close personal relations with them for whom we mourn; and were the constant witnesses of the exercise of the noble qualities which evidenced the exalted character of the one, and of the rising eminence of the other.

It is hardly more than a week since Dr. Charles Frick stood among us in a robust health that promised long continuance; and a week ago yesterday he joined the throng of mourners who followed to their last resting place the remains of our young and esteemed professional brother, Dr. Berwick B. Smith. Who, then, that looked upon his manly form or watched his vigorous step, could have entertained the fatal suspicion that Death had already sped his poisoned arrow and marked him as a new victim? Yet even at that time the barb had reached its quarry, and lay rankling in his bosom.

Upon completing the usual course of college instruction, CHARLES FRICK, at the age of sixteen, determined upon embarking at once in an active career; and accordingly he sought and obtained the position of assistant civil engineer in the service of the Baltimore and Ohio Rail Road Company. For years he labored in the field of his duties with an assiduity which met with the fullest approbation: but unable to restrain the impulse which burned within him, he abandoned an avocation which promised him abundant success, entered the office of Dr. JOHN BUCKLER, as a student of medicine, and matriculated in the University of Maryland in 1843.

It soon became manifest that he had not mistaken the suggestive promptings of his genius, for, after pursuing his studies with a zeal, to which those who were his fellow students can testify, he graduated with distinction in the Medical Department of the University, in the spring of 1845.

But although Dr. FRICK now stood before the world in the enviable attitude of one who had merited and received unusual honor in his class, he felt the need of a closer approach to disease than was possible even at the Baltimore Infirmary, and longed for the privileged opportunity of applying at the bedside the high principles of Medicine; of putting to a practical test the accredited doctrines of disease; of witnessing the varied phenomena exhibited in all the phases of morbid affections; of rendering diagnosis certain and treatment effectual; and of cultivating a more familiar acquaintance with the normal and pathological anatomy of the human frame. Being sensible that the wards of the Baltimore City and County Alms House afforded the desired advantages, he procured his nomination and election as one of the resident students in that Institution, and entered upon his duties soon after the attainment of his degree. Under the guidance of most excellent attending physicians he made solid and rapid progress in the task he had assigned himself, enjoyed much reputation for faithful and accurate observation and for comprehensive analysis, gained all hearts by his sterling integrity and gentle demeanor; and left the Alms House in 1846, after a little more than a year's residence, followed by the regrets and best wishes of all its inmates.

Being resolved to devote himself entirely to the profession of his choice, Dr. Frick soon associated himself with three of his cotemporaries for the purpose of affording united professional assistance to the poorer classes; and after a brief interval he became one of the four instructors who inaugurated an establishment for private medical teaching, under the title of Maryland Medical Institute. It was in this little institution that his aptitude for imparting information forced itself on the attention of his colleagues and pupils; and at the same time his genial manner so won upon those by whom he was surrounded, that he attached them to him by ties of respectful and most affectionate regard. Upon the closure of the doors of this preparatory school, Dr. Frick applied himself with renewed energy to the practice of his profession; and receiving soon afterwards, in 1849, the appointment of Physician to the Maryland Penitentiary, he found ample occasion for the exercise of his skill and for the application of his extensive knowledge. During the long term of his service as medical officer of this penal establishment, he gave constant proof of his rare ability, contributed largely towards rendering the hospital system more humane, reduced the mortality of the incarcerated, and shortened their average number of hospital days. Nor was his active and well-stored mind at rest upon the past: he gathered a harvest where none had cared to apply the sickle; and besides other valuable contributions, he gave to the world most acceptable and original views upon Diuretics and Renal Pathology, as well as extended and laborious analyses of the Blood and Urine. In fact, he so enlarged the scope of his official duties, as notably to increase the difficulty of their performance by any successor.

Dr. Frick established himself definitely in Baltimore, by contracting a matrimonial alliance in 1854. In the next year, he became one of the Physicians of the Union Protestant Infirmary; and, upon the creation of the Maryland College of Pharmacy, the acquirements and practical talents of Dr. Frick had become so generally recognized, that he was immediately chosen to fill the Professorship of Materia Medica in that Institution; and in his new position, he not only affirmed the assurances he had given, but he laid the foundation, by his mastery of the art of lecturing, of his future remarkable success in another and more extensive field of labor.

In the spring of 1857, Dr. Frick made a short trip to Europe, and visited the Hospitals of the English and French Capitals, with serious intention and profitable results; and upon his return, he relaxed none of his energy in the acquisition of knowledge, nor of his devotion to the poor, the sick, or the afflicted, who sought his aid or professional assistance.

In 1858 a vacancy occurred in the Faculty of the University of Maryland, whereupon, as the recollection of every one here present will bear us out, all eyes were turned towards

Dr. Frick as the man above all others in the medical profession in our city, whose entire fitness for the chair was preeminent and undeniable; and when the Faculty, in verification of the universally expressed opinion, elevated him to the Professorship of Materia Medica and Therapeutics, most hearty congratulations were offered as well to the new Professor as to his colleagues; and the most confident predictions were uttered as to his success as a Teacher, and the considerable part he was likely to take in extending the usefulness and reputation of the Institution.

Upon accepting the newly conferred honor, Dr. Frick retired from his position in the Penitentiary, entered upon the discharge of the clinical duties incident upon his recent appointment, and formulized material for the approaching session of the University. Professor Frick opened the session of 1858–59 in a discourse of great elegance; stamped a powerful and individual impress upon the course of Lectures he delivered; and conducted his clinical teaching in so strikingly original, truthful and instructive a manner, as to fill his friends with pride and admiration.

Again he had finished his course, and renewed his attendance in the wards of the Baltimore Infirmary, when a case of pestiferous Diptheria fell under his care. In vain he exhausted the resources of medicine, which few could so well command—in vain he afforded the last hope, that surgical interference could promise—the patient succumbed to the malignity of the disease. Happy had it been for us, if the destroyer had paused here, and arrested his fatal step! but alas! the poisonous exhalation only quitted the quivering and dying frame, to fasten with unyielding grasp upon him who had extended his arm to save. From Tuesday to Sunday is a brief period, but in that short time, the fearful work was accomplished; and the hour of noon had hardly sounded on the 25th of March, when our friend and brother had laid down his life. He died, as he had lived, all patience, all courage, all endurance.

If we sadly contemplate the life of Dr. CHARLES FRICK, we find it even, consistent, and noble. As boy, youth, and man, he was true to himself, was brave, generous, compassionate, toilsome, and mindful of others: as a friend he was considerate, faithful and full of the warmest affection: as a Physician he was wise, gentle, discreet, and replete with the kindliest sympathy: as a Teacher, he was full of knowledge, ability, and the most earnest resolve to render a good account of his trust. In short, in every relation of his brief existence the exalted character of Dr. CHARLES FRICK shone with untarnished and steady lustre; and he has left behind him a remembrance which we love and honor, and an example that is worthy of all imitation.

Such was the man to whose memory we offer this heartfelt and melancholy tribute.

The following resolutions were then read:

WHEREAS, An all-wise Providence has visited the Profession of Medicine and this community with sad bereavement in the death of Professor CHARLES FRICK, we, the assembled Practitioners of Medicine of Baltimore, seek this occasion to give expression to the heartfelt grief which animates us, his professional brothers, and to our appreciative sense of the loss we have sustained; therefore

Resolved, That we deeply deplore the decease of Professor CHARLES FRICK, a man young in years but old in the practice of all those virtues which ennoble mortality; a friend honest and sympathizing and steadfast; a physician hardly in his prime, but already eminent for his cultivated mind, his accurate and confident judgment, and above all for his ready and unselfish devotion to the cause of suffering humanity.

Resolved, That we warmly cherish his memory as man, friend and brother.

Resolved, That we offer to the family of Dr. FRICK our heartfelt sympathy under this affliction.

Resolved, That a copy of these resolutions, signed by the officers of this meeting, be sent to the family of the deceased: and that the resolutions be published in the newspapers of the city.

Prof. LOUIS H. STEINER said that, as one of the committee, he had been delegated to present the following resolutions, expressive of the sentiment of the profession, in regard to the death of DR. BERWICK B. SMITH. He had not the pleasure of a long acquaintance with Dr. SMITH, but knew that he possessed in no small degree the skill which had distinguished his father and grandfather. Dr. SMITH'S labors in the Infirmary during the past year, gave promise of much usefulness, and evidence that he would be a credit to the profession. Those who knew him best personally could speak more intimately of him. It devolved on him as a member of the committee, to present the following resolutions:

WHEREAS, It hath pleased God, in the mysterious dispensation of His providence, to remove the soul of our professional associate, Dr. BERWICK B. SMITH; therefore, be it

Resolved, That in the untimely death of Dr. SMITH, the community has lost one, whose surgical skill, and knowledge of anatomy and practical medicine, had given promise of future eminent distinction in the profession which he already honored.

Resolved, That we sympathize most sincerely with the family of the deceased, in this their great bereavement, praying that He, who hath sent the stroke, may also bring consolation to the wounded heart.

Resolved, That a copy of these resolutions, signed by the officers of this meeting, be sent to the family of the deceased, and that they be published in the papers of our city.

On motion of Dr. WHITE, the two series of resolutions were considered separately.

Dr. F. Donaldson, in moving the adoption of those relative to Dr. Frick, spoke as follows:

Mr. Chairman:—In rising with a view of moving the adoption of the resolutions reported by the Committee, I cannot refrain from venturing to give expression to some of the feelings which this sad event has called forth. Indeed, sir, although I have been all day suffering on my bed with sickness, yet I could not consent to stay away from this meeting, and lose the last opportunity of paying my willing tribute of respect to the worth and memory of one whom I reverenced as a man of science, whom I valued as an instructor, and whom I have long loved as a friend.

In other professional bodies, resolutions of this kind are passed so habitually as to have become common-place and meaningless; but with us such never has, and, I trust, never will be the case. It is appropriate that the rare exception should be made at the death of Dr. Charles Frick, for he was no ordinary man,—he was no ordinary physician. Our resolutions, as laudatory as they are of his virtues, and as expressive as they are of the sense of the profession of the loss they have sustained, but tell the simple truth. Gifted as he was by nature with a high order of talent, he had combined with it a cultivation and industry, which had enabled him to attain a prominence in medicine but rarely reached by one of his age.

For many years he had been a diligent student of nature, and a close and careful observer of disease. He early in his professional studies recognized the fact, that medicine was not, when properly viewed, a science, but rather an aggregate of sciences, each of which, when occupying its appropriate position, and firmly cemented to the others, gave strength to the arch which had for centuries deserved and received the name of the Science of Medicine. He therefore mastered it, by becoming in succession familiar with its several parts from anatomy to chemistry; and for four years previous to his death he had been teaching Therapeutics—the end and aim of the cultivation of all the others. His motto ever was—what was worth doing, was worth doing well, and promptly. He therefore was careful and thorough in all his observations; no matter what he attempted to investigate, whether it was an ordinary case of disease, or a minute, delicate point of physiology or pathology. It was this fact which gave such weight in the medical profession to his published results—all knew that he was never hasty in his conclusions. He possessed indefatigable industry, for he never tired in his search for truth. When he became interested in a point, he pursued his inquiries as far as he possibly could, spending any amount of time and thought upon them.

Dr. Frick was an accomplished scholar in Medicine. He eagerly read the publications of others, and after sifting well the contents of the journals and new publications as they came from the press, he stored them away in a memory remarkable naturally for its retentive powers, but, like all his other mental faculties, rendered more accurate by cultivation.

No one familiar with Dr. Frick's published productions, and no student of medicine who has been privileged to listen to his lectures, could fail to see that he was an original thinker. When he began to teach, he found so much that had been handed down from one author to another, that he determined not to be blindly led by them, but to discriminate, in his own teaching, facts from traditional assertions. His writings all bear the impress of much thought and study, and have the always attractive features of clearness and simplicity in style. His views he announced with a modest boldness characteristic of the man; modest, because he had ever a diffident shrinking from publicity,—but it acquired boldness from his love of truth, and from his desire for its promulgation, no matter how it infringed upon the prejudices existing previously. Young as he was in years, these contributions to science had given him an enviable reputation at home and abroad, and with us the best test of a man's real worth is his standing in the profession,—his popularity out of it may be attributable to other causes. Even as far back as ten years ago, I remember well the thrill of pleasure I experienced at hearing his views on dumb-bell crystals quoted, in a lecture in Paris, as authority. This is not the time or place for an analysis of his publications, but we need no better evidence of their appreciation in this country, than the avidity with which the medical periodicals have sought after them. Recently the proprietors of a Journal applied for a series of articles from his pen, it being stated that they were willing to pay any price for them. His reply was characteristic, namely—that he could not consent to write by contract for money. With him every thing connected with medicine was a labor of love warmed into enthusiasm. The scientific side, as it were, of medicine was attractive to him, not only from its intrinsic interest, but more especially because he loved Medicine as an Art, for it gave full scope to his philanthropic disposition. A bright example for us, gentlemen, of one converting his high scientific attainments to useful, every-day practical purposes, constituting him an admirable practitioner of Medicine.

But there was in this man, Mr. Chairman, as no one had a better opportunity of judging than yourself, more than intellect, cultivation, industry, and love for science. These are qualities which we cannot but admire, but of themselves we gaze at them in wonder; as has been said with truth, "they attract attention as remarkable, but they do not inspire love for the individual so gifted." Had these been all, we should not have had the large response to the usual invitation in the public prints for the friends to attend at the funeral. These intellectual features could not have drawn out the whole medical profession of the city, every medical student, and so large a number of his patients, to join in that mournful train to the grave. Nor would these qualities of themselves have brought so many of his professional brothers here this evening, to express their grief at his untimely death. No, sir, he had something far higher than these, Nature's endowments well cultivated, he possessed traits of the heart that endeared him to all. He had the faculty of making all he was thrown with, in and out of the profession, his friends. It was kindness and affection on his part towards others, which inspired the same feelings from others towards him. These qualities of his better man had been kept alive by the fuel of unceasing acts of kindness to all about and around him. He had that rare combination of strong masculine points of character, such as courage, self-possession, firmness and decision, with those gentler ones which we look for in the other sex, but which, when found in the manly character, give it softness and attractiveness. These "womanly virtues," as they have been termed, of gentleness, forbearance towards others, and modesty, he had happily blended with the "sterner virtues." It was this that made him so generally acceptable as a practitioner. Those of us who, in his occasional absence from town, have attended to his practice, can testify to the devotion of his patients to him. Not only had they the most unbounded confidence in his medical acumen, but they loved him as their friend. His many acts of disinterested kindness to the poor, and his unremitting attention to them in sickness, won for him a place in their affections never to be effaced. It could not have been otherwise with one of his sympathizing disposition. Even the hardened convicts of the Penitentiary were softened by his uniform kindness and consideration, and his influence for good was manifest while they remained in prison, and, in many cases, even after they had served out their term. I have known him, when a student at the Alms-house, to weep at the death of a pauper, so interested had he become in her while attending her.——He never looked upon cases of disease in a cold, professional way, for his warm heart forbade such heartlessness. He could not lose sight of the fact that it was suffering humanity.

As a teacher of medicine, Prof. Frick has had but few equals. His peculiarly happy facility of imparting his richly stored fund of knowledge to his class, had already gained for him a reputation as a lecturer.

Among the members of the profession, he was every where recognized as the high-toned gentleman, whose nice and delicate sense of honor never permitted him to suspect others; his own dictates rendered unnecessary any codes of ethics.

I have no disposition, Mr. Chairman, to tread within the sacred precincts of his domestic life; but such a man could not have been otherwise than an affectionate son and brother, a devoted husband, and a fond father.

I had known Dr. Frick intimately from boyhood, and had watched his consistent progress and development. As a boy, his warm heart and cordial manners made him many friends; although at the head of his classes, yet he never excited jealousy. His assiduity urged on his fellows, and his fondness for study gave them a taste for it. Our now venerable and beloved teacher told me, a few years since, that, in an experience of thirty years, *Charles Frick* was the smartest boy he had ever had charge of,—in one word, the "child was father to the man." When we were at the Almshouse as students, his enthusiasm was infectious in its character, and his promise there for eminence was unmistakable.

I saw and admired Dr. Frick at that most trying period of every professional man's career, for I witnessed his patient waiting for practice. No temporary want of success could divert him from his determination to follow the profession of his choice. And now, when he appeared about to reap the fruits of all his study and unremitting labor, he has been cut down in the prime of his manhood. To us he seemed at the commencement of a long life of great prosperity and usefulness, in which he was to benefit the science he had loved with so ardent an affection. I had figured him as the future *Todd* of America, not inferior to the Englishman either in reputation or in brilliancy. His was a kindred spirit, and in his fine analytical mind and originality he unquestionably resembled him. We, in our poor human blindness, thought he had but begun his noble work,—to the eye of Infinite Wisdom it had been completed:—a warning, gentlemen, to teach us to be less confident in our contracted, mortal judgments, and to be more patient of results we cannot control. Ought we to let pass unimproved the example his active and useful life has set us of devotion in furthering, in every way in our power, the best interests of the noblest of avocations?

Shall I speak of the still higher lesson the circumstances of his death have taught us? On Wednesday morning he was attending to the active discharge of his duties in the full vigor of his matured mind, and healthy, handsome frame, buoyant with bright hopes of the future,—the pride of his friends, and the ornament of his profession. On Sunday, at half-past twelve, he was numbered with the dead.——

I have given the simple text—let each one of us write the sermon in his heart.

As I stood by his dying bed, it was sad to think and hard to realize that we were never again to feel the warm, affectionate grasp of his hand,—never again to be cheered by that pleasant smile,—that we were to hear no more the soft, mellow tones of that voice, and that those lips were closed forever to words of earthly wisdom.

As I saw him close for the last time those eyes I had so long known as beaming with intelligence and expressive of kindliness, I felt that a great light had gone out in the medical world,—a light of such unmistakable clearness and distinctness, as to guide into the right path those who were commencing their medical journey,—a light cheering and aiding his contemporaries, and one of such brilliancy as already to have attracted the attention of his elders in medicine, who were beginning to appreciate its value, and to avail themselves of its power of clearing up the obscurities of diagnosis, so as to enable them to ferret out the intricacies of disease. Although this shining light has been extinguished by that unsparing destroyer—Death, yet we must continue for a long time to feel its vivifying influence.

Now that he has gone forever, I am sure every heart here will throb to the wish—that he may rest in peace, and rise in glory.

Professor STEINER supported the adoption of the resolutions, and said:

This is one of the saddest moments of my life. Two days since, while gazing on the corpse of our departed friend, it was difficult to recognize its identity with the bright, sparkling eyes, the genial hearty smile and friendly expression that were so peculiarly prominent in the features of Dr.

Frick. The occasion was intensely sad and solemn, because we were paying the last tribute of respect to a fellow being, and we were surrounded by the external signs of grief and the habiliments of woe. Still the fact that *he* was dead, whom we had all learned to love, could not *then* be realized. Now, assembled, as we are, to consider the nature of our loss,—in this hall where objects that he used to illustrate his first course of lectures in a chartered College, surround us on all sides,—where the very desk from which those lectures were read is before us, and sorrowing hearts are all around, the reality of the bereavement becomes most painfully evident. I say this is a sad moment, for *now* I feel that we have lost a friend and a brother, whose hands were ever ready for any work that his professional position demanded, and whose kindly aid was ever freely given to the deserving and the needy. I trust you will pardon me for saying a few words of him as a man, and a physician. Others may have known him longer,—none could have loved him more, and I feel impelled to bring a slight tribute of respect along with those which the friends of his youth and manhood are now paying to his memory.

As a man, he was remarkable for his freedom from the insincerity and hollow-heartedness which so frequently finds a place in the character of our rising men. There was no concealment of opinion on any subject submitted for his consideration, but freely, frankly and unreservedly his conclusions were stated, with a careful avoidance of expressions that might bring pain to those differing with him. The very kindness of manner would remove the unpleasantness of the decision, and would force respect. There was a contempt for every thing, smacking of mere policy, prominent in all his acts. Whatever of position, honor and fame he had gained, was the result of true merit,—the just reward of honest labor,—and not the result of any deeply-laid or carefully-digested plans. The record of no man's life in this community is brighter than that of our friend's in this respect; no man's honors are more free from taint or spot.

Associated with this, and growing, as it were, from the same root—a perfectly honest heart, was an almost feminine modesty, and diffidence as to his own knowledge and acquirements. There was none of that assumption of authority which extensive reading and much experience too often give a professional man. His opinions were to be obtained by request; they were never thrust forward before the notice of his companions and friends. Indeed there was a reluctance to put himself in the position of disputant, even when misrepresented. As an illustration of this, an incident may be mentioned, which occurred last year. It is known to most of my hearers, that some of his views, published years since, were singularly misrepresented by the late Dr. GOLDING BIRD. Having had the last edition of Bird's book referred to me for reviewal, thinking it would afford him an opportunity of setting himself right on this subject, I asked him to undertake the preparation of the review. His reference to the misrepresentation consisted simply in a statement of *what he had said*, without the slightest complaint or reflection on the English author. And thus was it ever.—To *no* one can we more honestly apply the words of the Latin poet, *nil de mortuis nisi bonum.* For here was a man of whom only good could be said.

The life of a large circle of friends, his cheerful spirit ever made him a welcome visitor. It brought smiles to the weary and heart-sick, comfort and relief to those who sighed over false friends and heartless companions, and spread the contagion of its influence far and wide. His very salutation made you feel that here was a man, not the creature of habits—the slave of conventional rules, but one of nature's noblemen,—nobler far than wealth, or rank, or honors could make any man. There was no wonder why men loved him. It would have been a cause for enquiry if he had not been loved. As the diamond will always attract attention and command admiration, though surrounded by countless imitations, however perfect, so the good and honest soul ever must shine forth brightly amid the imitations of goodness and honesty by which it is surrounded. To whom indeed could we apply with more truth those rapturous encomiums, which Tennyson uses in his poetic memorial to his friend, than to our departed friend:

> "He
> To whom a thousand memories call,
> Not being less but more than all
> The gentleness he seemed to be,
> So wore his outward best, and joined
> Each office of the social hour
> To noble manners as the flower
> And native growth of noble mind;
> Nor ever narrowness or spite,
> Or villain fancy floating by,
> Drew in the expression of an eye,
> Where God and Nature met in light.
> And thus he bore without abuse
> The grand old name of gentleman
> Defamed by every charlatan
> And soiled with all ignoble use."

As a physician, Dr. FRICK'S career is one well worthy of imitation by the younger members of his profession. Possessed of natural abilities, he did not disdain the aids which study, investigation and experiment bring to the professional man. Others' views were always examined with a freedom from prejudice and a carefulness of judgment that enabled him to select that which was reliable and trust-worthy, rejecting the chaff and worthless matter with which it was surrounded. Thus his knowledge of a growing science was ever growing with it, and his advance was along side of that of his *confreres.* He was not a mere novelty seeker, but held, with a firm grasp, to all that the experience of ages had stamped with the mark of its approval. With a clearness of intellect granted to few men, and a wonderful command of plain Saxon, he was able, from time to time, to furnish the columns of our journals with contributions that attracted the attention of all by their ability and merit, and won favor even from those who differed with him in theoretical knowledge. These have gained him a reputation by no means local in its character, nor indeed confined to our country, but co-extensive with the spread of medical literature itself. The sorrow which his death has produced is not confined to our city, but will strike sympathetic chords in the hearts of the profession throughout our country.

His relations to his patients were such that the most implicit confidence was reposed in his decisions; his words brought comfort to the friends of the sick, while comfort seemed reflected from his very countenance on the sufferer. Few men have had such agreeable professional relations. He was the friend of his patients, and the very confidence his presence brought, aided his remedies in their combats with the disease. He was "the good physician," and the kind friend, at one and the same time, and while his judgment contended with the mysteries of disease, his great loving soul poured forth its truest sympathies to the sufferer.

Four years since, at the formation of the Maryland College of Pharmacy, its Trustees wisely placed Dr. FRICK in the chair of Materia Medica. His success as a Lecturer, from the very first, was marked. Having speedily mastered his subject, it was a source of great delight for him to exhibit its mysteries in the most attractive form to the students forming the classes in that young College. Clearing away all intricacies and obscurities, he presented in a manner at once a model of clearness and accuracy, such facts as were essential to the student. His reward was speedily secured in the earnest and diligent habits of study which marked all his students. They loved to study, because he led them so gently and pleasantly along paths that were attractive, from the very charms his own manner reflected over them.

In the Spring of 1858, he was called to the chair of Therapeutics in the University of Maryland. The two courses of lecture delivered in that venerable school, during the sessions which have intervened since his appointment, have placed him in the first rank of Lecturers. The fund of knowledge gained from books, and the experience which years of practice by the bedside had given him,—these were so blended that each aided the other in enabling him to deliver lectures *unsurpassed* for practical utility by those from any other teacher of this branch, in the country. Not only students attended these lectures, but those who had spent years in the practical details of the profession, found them attractive, and of advantage. I am bold to say that no young lecturer, in so short a time, satisfied every one, as to his consummate fitness for his duties, and obtained so general a reputation as a teacher. There was but one opinion with all who heard him,—and that was of perfect and absolute satisfaction.

Surely, life never looked brighter to any man. His lovable manners, frankness and sincerity, cultivated intellect, thorough knowledge of the theory and practice of his profession, perfect success as a teacher, had gained him friends beyond number; and all seemed bright and fair and attractive.

One week since he attended the funeral of a colleague, and then spoke of the untimely end of one whose talents had gained him an enviable professional reputation—of how sad it seemed that death should thus pluck one from his career of opening prosperity. But that death which had aroused all the sad feelings of our nature, was speedily to be followed by another.

> "Disasters come not singly;
> But as if they watched and waited,
> Scanning one another's motions,
> When the first descends, the others
> Follow, follow, gathering flock-wise;
> * * * * * *
> First a shadow, then a sorrow,
> 'Till the air is dark with anguish."

The seeds of a singularly fatal and insidious disease, were then undergoing that process of incubation, which developed into its most complete virulence on the morrow. A few days of suffering, born with heroic courage, and death had seized our friend and brother, before the fact of his sickness had been made known to the community in which he lived. He died as he lived, devoted to his profession, and, taking the circumstances of the attack into consideration, we may say, with *truth*, a martyr to that profession. He fell in the performance of his duty,—adding another name to the list of earth's heroes. It needed not the long train of mourning friends, that followed his remains to the tomb, to satisfy us that the community appreciated the loss it had experienced, for sad faces met one everywhere. All knew that a place had been made vacant, which could not be filled.

The truth that he is gone, is painfully manifest, I have said, now that we are collected together. Let not the example of such a life be lost on those who are left behind. Be it our privilege to treasure up the recollections of our beloved friend, as precious jewels in the storehouse of memory,—and so to live and to act, that if death should find us in the heyday of life and prosperity, we may be able to go to our homes in peace, having placed our trust on a reliance stronger than that of earth. Be it our privilege to pray that the Almighty Father, who never sends burdens beyond the power of his children to bear, if they but claim His assistance, will grant that sustaining strength and comfort to the afflicted and sorrowing family, which may enable them to see that even

"Behind a frowning providence,
God hides a smiling face."

Dr. EDWARD H. WHITE then addressed the meeting:

MR. PRESIDENT:—I can but repeat the sentiments that have been already reiterated.

Dr. CHARLES FRICK was endowed with a happy union of moral and social attributes, that ennobled his character, and endeared him to his acquaintance.

A few days since, he was an active participant in those interests and sympathies, that constituted him one of ourselves. But in the fulness of bodily and mental health, to the hour of his fatal seizure—not yet in the maturity of manhood—young in years—he has been stricken down by the hand of a dire disease! He has fallen, however, in the faithful discharge of duty to his suffering fellow creatures. A befitting and acceptable end—if it were to be! Not more from the inherent beneficence of worthy and generous conduct, than as a testimonial to himself, in the implied possession of qualities, that commended him to the future wants and interests of society.

In this relation, then, not less than in the social and moral aspect referred to, the community has sustained a loss, not easily repaired: for among its rising members it would be difficult to point to one who had devoted his energies with more untiring constancy, or with brighter promise of success, in the noble endeavor to render to society whatever of advantage the measure of his faculties might enable him to practice.

He had steadily devoted his life to the scientific and practical pursuit of medicine, that he might offer the best professional attainments to the amelioration and relief of suffering humanity. So that, viewed in reference to the future wants of our community, whether they pertain to the direct necessities of those who may be sick, or to the no less importunate solicitude which their sufferings exact from near relatives and friends, we are prepared to appreciate the loss of his character, and of his proficiency.

But our affliction does not end here! Seen in the light of his sincere devotion to science, for the sake of the most appropriate ends to which knowledge can be directed, the medical profession cannot fail to be impressed with a sense of its special bereavement.

Dr. Frick possessed, in an eminent degree, a discriminating capacity for the appreciation of the facts of science; as well as the yet more valuable faculty of so comparing, and of so combining these, in their true relations, as to deduce therefrom the best practical results. All who had the privilege of observing the usual accuracy of his conclusions will certainly bear testimony to this fact.

And, if it be the true teaching of history, in every branch of knowledge, that these qualities of mind, more than any others, ultimately distinguish their possessor, and render him useful to the cause of learning and humanity—by enabling him to make truer interpretations, better rules for future ascertainment of truth, and improved principles for guidance and action—then Dr. FRICK united in his character much that identified him with those whose lives have been recognized as valuable to their fellow-men.

Nor did the endowments of mind, that enabled him to observe accurately, and to appreciate justly, the phenomena of nature, stand as isolated and unsupported possessions: but they were happily conjoined with a union of heart, a steadiness of industry, and desire for advancement in useful knowledge, that must unquestionably have secured for him a distinguished degree of efficiency.

As a writer, his contributions had been frequent, and it may be said, that his success in medical literature was already established.

As a Professor in the University of Maryland, in which he filled the chair of Materia Medica and Therapeutics, the popularity and entire acceptability of his lectures to the class of students affords the truest criterion of his proficiency.

As a teacher at the bed-side of his patients, the students who enjoyed the opportunity of his clinical delineations, have proclaimed him most successful in this important department of instruction. Indeed, he so far excelled in this particular branch of his duties, that, it may be justly said of him, he was endowed with a peculiar talent for the task; and that he has left behind him, anywhere, in this relation, but few, who were his superiors.

And shall we not, then, conclude, from these outward lineaments of mind and character, that his moral and intellectual nature was so fortunately constituted as to have afforded ample security of rare usefulness in the career of his choice? that the memory of his excellence, and the elevated purity of his purposes in life, should not be allowed to pass away as the night of an arctic summer, displaced almost as soon as we are conscious of it, but should offer his character as an example, worthy of all imitation, to cheer and encourage the younger members of our profession to a similar path of duty? And, that, in expressing our sense of bereavement in his death—and in tendering our smypathies to those still more nearly, and more deeply afflicted—we are but obeying the promptings which his assemblage of virtues spontaneously demands?

Dr. C. C. Cox, of Easton, Talbot Co., spoke as follows:

Mr. CHAIRMAN:—Although here this evening by the merest accident, and with no claim to residence, I feel that in a meeting of professional *confrères* I am no stranger, and, therefore, that the brief and simple utterances of my sympathy upon this melancholy occasion, will not be regarded as obtrusive or altogether unacceptable. I am thankful that in the great brotherhood of physic there is no such thing as sectionalism, and was I here from either extreme of the Union, having been benefitted by the labors, and a sharer in the good name and growing reputation of the departed, I should feel privileged to express my sorrow at a loss which is not yours only, but the common misfortune of the profession, wherever science is regarded or true worth acknowledged.

My personal knowledge of Dr. BERWICK SMITH was limited to a few brief interviews, the recollection of which steals pleasantly over me, now that he is no more. There was a retiring gentleness in his disposition which won regard, and a modesty in his general demeanor rare as it is commendable. It has been well said, that his unquestioned skill as a surgeon was, to a certain extent, an inheritance. He belonged, indeed, to a noble line of professional ancestry. His grandfather was the Sir John Hunter of the North, in his day. Equally skillful as a physician and surgeon, his practice embraced the entire circle of the New England States, while he found leisure for valuable contributions to medical literature, and, by his enterprise, founded some of the most respectable scientific institutions of the East. Among these was the Medical Department of Dartmouth College, in which he lectured alone for a great number of sessions, upon all the different branches of medicine. Of the father it is needless to speak in the presence of a Baltimore audience. We all remember his first entrance into this city, and the early discouragements which attended him for a series of years. But success, which comes sooner or later to solid worth and unyielding perseverance, rolled in upon him at last like a flood. His progress, at first slow and fitful, has become rapid and certain, until it will not be considered invidious to assert, he stands now, among the profession of the City and State of his adoption, PRIMUS INTER PARES.

Although it was never my happiness to enjoy much intimacy with the late Professor Frick, I could not fail to observe and appreciate in some degree, at least, the various excellencies of character by which he was distinguished, and which have been so amply and eloquently alluded to this evening. There was about him a transparency which revealed the purity of his heart, and the depth and richness of his intellect, almost at a glance. No one who came in contact with him, however casually, failed to admire the genial qualities of his nature, the extensive and varied attainments of his vigorous mind, the fertility of his medical resources, and the rare accomplishments which contributed to constitute him—what he really was—the polished professional gentleman.

The character of the sad event is pregnant with interest to us as medical men. He died at the post of duty, grappling with disease in its most appalling shape. A monument rises above the dust of the soldier who falls battling for his country's honor,—but the physician who sinks on his fearless errand of mercy, before the breath of the contagious pestilence, not unfrequently misses a rude stake to mark his resting-place. It is, perhaps, better so. There is often a remembrance of good deeds in the hearts of survivors, more durably inscribed than upon marble or granite. Years after he is gone will the memory of the good physician be cherished by those who were the recipients of his benevolence and skill,—wreaths of flowers moistened by tears of gratitude be deposited on his honored turf, and his name crowned with the blessings and remembered in the prayers of many a noble spirit.

The sudden dispensation by which we have been deprived of our Brother, should not be without its influence upon us—and while the sound of the falling clod still echoes in our heart-chambers, let us appropriate the great truth his untimely demise so strikingly illustrates: "*In the midst of life we are in death.*" Looking around, two weeks ago, upon the ranks of the young and robust of the Profession, who would have selected CHARLES FRICK as the first victim? But he has gone—gone so suddenly that we are yet scarcely aroused to a full realization of the event. He fell, while the tides of health and enterprise were flowing strongly around him—fell with all the progressive interests of life full in his path—fell with the hopes of the future clustering about his opening way—

fell by the side of his prostrate patient, to remind us that while resisting the advances of disease and death upon others, we ourselves are not invulnerable to the fatal shaft.

But the object of these crude remarks is accomplished. I arose, sir, simply to express my individual sense of the sad events of the past fortnight, by which the profession of Baltimore has been deprived of two of its most promising young men, as well as my cordial concurrence in the resolutions of respect presented by the respective committees, and so eloquently enforced by the gentlemen who have preceded me.

Dr. GEO. C. M. ROBERTS remarked that the members of the Profession and the friends of Doctors FRICK and SMITH would like to have these tributes to their memories in pamphlet form, and he accordingly suggested the propriety of having them published.

Both series of resolutions were then unanimously adopted and the meeting adjourned.

CHRISTIAN UNION,

AND THE

Liturgical Tendencies of the Times.

FROM THE MERCERSBURG REVIEW FOR OCTOBER, 1859.

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1859.

CHRISTIAN UNION, AND THE LITURGICAL TENDENCIES OF THE TIMES.*

St. Paul, in his exhortation to unity, says, "there is one body, and one Spirit, even as ye are called in one hope of your calling; one Lord, one faith, one baptism, one God and Father of all, who is above all, and through all, and in you all." How at variance with this idea, does the visible Christian Church appear when submitted to the most superficial examination! The unity of the Spirit is *not* preserved in the bond of peace, but a number of sects or divisions, all grounding their hopes on the same truths, are battling, with the furious rage of Belial's troops, against each other for things that their honesty forbids them to look upon as essentials. The one body, the head of which is Christ, no longer shows itself as an organic unit, and the one Spirit seems to have assumed a great variety of forms, so that the enquirer for truth is bewildered in his search. Is the ideal unity, spoken of by Paul, not possible on earth, and are we doomed to grieve all our days that the strifes, dissensions and divisions of Christians are more difficult to quiet and to suppress, than those of politicians and mere men of the world? Political parties may be divided by sections and caucuses, but these are readily broken up when a decided and firm stand is required in an attack upon their opponents;—enemies become reconciled, hard words are thrown aside, and a common sentiment of love for, and pride in, their party animates all, so that the contest is active and vigorous. But how often are the good effects of Christian labors made null and void, by the spirit of sectarianism creeping in the council-chambers of the saints, and there contending for its own success rather than for that of the Church Catholic! As much joy (and even more in some instances) is felt in the transfer of a Christian from one denomination to another, from the superintendence of one shepherd to another, as is experienced when a sinner is brought from the paths of worldliness and sin into the walls of the Church. It is said that the different denominations constitute different regiments, all fighting in the great army of the Captain of our salvation, but who ever heard, in a well-regulated army, of desertions from one regiment to another,—of jubilant shoutings and extravagant demonstrations of joy at the increase of one portion at the expense of another? No! regiments, while possessed of a pride which makes them all the more active in time of service, would disdain increase of numbers obtained in this way. They are all contending for one common object, and under one great Commander,—but contentions among themselves, would destroy discipline and subvert all the plans of their leaders.

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* Anniversary Address on Ministerial Union by T. H. Stockton, Pastor of the Church of the New Testament, &c. Phila. 1859. 36 pp.

Christian Union, and the Protestant Episcopal Church in its relations to Church Unity. By William H. Lewis, D. D,. Rector of the Church of the Holy Trinity, Brooklyn, L. I. New York. 1859. pp. 116.

Mixed Societies, in Principle and in Practice. By the author of "An apology for the common English Bible," (Rev. A. C. Coxe, D. D.). Balt. 1858. pp. 84.

Review of "Mixed Societies." (Anonymous.) Balt. 1859. pp. 45.

But Christ, in His ever-memorable prayer for His Church, prays "that they all may be one; as Thou, Father, art in me, and I in Thee, that they also may be one in Us, that the world may believe Thou hast sent me." Here is clearly embodied the typical condition of the Church, one in itself, one with Christ, so that even the world seeing this unity of the Spirit in the bond of peace, might believe that He was sent by the Father. Now the present condition of the Church militant, not only militant against the world, the flesh and the devil, but against itself, is far from exhibiting this unity, and one interesting fact is presented to us in the recognition of this abnormal state of affairs by Christians generally. It is the first essential in the right direction, that we should clearly recognize our errors, see how they differ from that pristine condition when the

Church, by its united and firm stand against the powers of the world, battled for the truth, in despite of death, life, principalities, powers, things present and things to come, none of which were able to separate it from the love of God as it is in Christ Jesus. Such a recognition of error prepares us for the close consideration of the manner in which we can retrace our steps, and strive after that spirit which, while it will allow *in dubiis libertas*, will require *in necessariis unitas*, and above all *in omnibus caritas*.

Most devout persons are anxious on the subject of Christian union, although we have heard a labored argument, from a Professor in a Theological Seminary, in support of the present condition of the Church, as being *best* adapted for its preservation in purity from the errors that heresy *might* introduce. Such special pleading, in support of *existing* error as a safe-guard against *presumptive* error, is too shallow to require refutation, and few can be found who will cling to it as any defence of division. But although the majority acknowledge the abnormal condition of the Church, and agree with commendable harmony in praying "that all who profess and call themselves Christians may be led into the way of truth, and hold the faith in *unity of Spirit*, in the bond of peace, and in righteousness of life," and that God would make the Church "strong and mighty against all heresy and schism, against all error and corruption,"—still the nature of that common platform on which all can meet, is by no means agreed upon with unanimity. Each has his own plan to offer,—each some private conception of the way this great end is to be effected, which *he* considers as failing to be operative, *only* from the fact that the world is so full of bigotry, so opinionated that it will not yield to the suggestions which his mature reflection have produced.

There are, however, several plans of union that have been proposed and have collected around them warm and enthusiastic supporters. A glance at these, and a kind consideration of their defects, and hence, their probable ultimate failure, will not be out of place here.

I. Although Christians are attached to their own denominations, and should labor for the success of these, still they *may* meet on the common ground of the great *Benevolent Societies* of the day. The Bible Society is intended for the distribution of the Holy Scriptures without note or comment; the Tract Society for the publication and dissemination of stirring appeals to the impenitent and lukewarm, and the Sunday School Union for the preparation of proper apparatus to be used in the training up of children to the stature of Christian manhood. Are these great organizations not proper spheres for Christians to labor in, and will not such labor conduce to the tightening of the cords of Christian union? View the religious history of our country for the last forty years, and see whether such has been the effect. Has the number of denominations diminished under the action of these Societies,—have the congregations, whose ministers have been most active in their management, coalesced or united in brotherly love, outside of the anniversary meetings? Such questions are significant and pregnant with importance in the determination of the subject we are now examining. They are propounded without any idea of denouncing these great agencies, but with the view of showing how inadequate these are for the solution of the mighty problem,—how there shall be a union of that body, which is now so rent and divided. We need organizations for the preparation and distribution of the Sacred Scriptures, for the dissemination of such material as will explain its meaning and publish the loving tidings of the Gospel, to superintend the education of the little ones of this world. They are needed, because the Church, in any one of its present phases, seems to have neglected these duties, and to have indolently folded its hands and waited for some action outside of itself. They can be made better adapted for the purposes, set forth in their constitutions, if the Church will superintend them, will control them, will use them as agencies *through* which she can operate. If she suffer herself to be controlled *by* them, then is harm done, if in no other way, by her loss of power in the carrying out of her peculiar office, as is always the case when control is consigned to other hands than those to which it properly belongs. If the Church was established, on the day of Pentecost, "as the home of Christ's continual presence and power among men," then must she be the prime mover in all operations which relate to the distribution of the Scriptures, to instruction in the way of life, and to the feeding of those lambs, as Christ commanded Peter when he professed his love for the Master. If there be a ministry, whose members are "the representatives of Christ's authority and the ambassadors of His grace," then surely these agencies should be committed to their care, and to their superintendence should the active operations of such Societies be assigned. But here we find the sect-difficulty coming up again, and, in the midst of the hoped for union, there is division; some will not unite in the work,—others require so much to be removed from the pages of Tracts and Sunday-school books that they lose their positive character and become too often of a vague and general nature. The evils are, however, *not* of such a character as to call for the extinction of these Societies, but for their use under the superintendence, control and direction of the Christian Churches, none giving up what it considers vital, but endeavoring to supply the deficiencies by the aid of its own ministry, and instead of becoming indolent in the work assigned it, knowing no rest night or day, but laboring to perform its duties in the great vineyard of the Lord. These Societies have not promoted, and are not likely to promote, Christian union,—but have been made useful, and can be made still more so, if the Church will labor to prevent the ignoring of fundamental truth in the effort to be generally acceptable to all parties. They would have no existence in a true, normal state of the Church, nor would Benevolent Societies, Insurance Companies, Alms-houses, City Hospitals and a thousand other charitable plans of the present be necessary, were the Church as it was on the day of Pentecost. They have all sprung up as lamentable proofs of her short-comings, and must stand until the happy day when she is regenerated and disenthralled from the corruptions of ages. If there be evils in these benevolent agencies, let them be removed, and let them be made as useful adjuvants as possible to the Church, but do not let them usurp her place and duties.

II. Christian union can be reached by associations which will have no creed but the Bible, and such bodies can rightly take charge of all benevolent operations; nay more, can perform all the duties of the Christian ministry, save alone the administration of the two sacraments, Holy Baptism and the Lord's Supper. This is the second plan of Christian union, which, in a peculiar way, seems to have been developed from the first noticed. It boasts the uselessness of Creeds,—their *injury* to the cause of Christ, inasmuch as they constitute points around which crystalize, according to definite laws, their adherents, presenting angles and edges sharply set against anything like union. The Reformation in Germany and England is considered as defective in the fact, that it did not throw off the effete creeds of the Romish Church, and proclaim full liberty of interpretation of the Scriptures, according to each man's private judgment. Had this been done, then we should have a *harmonious* (lucus a *non* lucendo, we suppose) Church, no sects, no divisions, but all agreeing—in what, we are not able to say, except in the right of each man to disagree with his neighbor. The fallacy of such a position is apparent, for even granting that each Christian could thus attain the full stature of godliness, the whole body of Christians would be, when compared with the condition of a Church faithful to a symbol embodying its views of scriptural doctrine, like a vast collection of little shrubs as compared with the sturdy tree whose roots are fastly attached, deep under the solid earth, and whose branches, luxuriating in an abundant flow of healthy sap, afford shade and protection to the weary and oppressed of every clime. Instead of a living organism, the Church would be an aggregation of foreign particles, adhering together with no great force or vital connection.

But throwing aside all considerations arising from a proper estimate of the true idea of the Church, what are the effects of this proposed plan of Christian union? Does the Baptist, who meets his Presbyterian brother on this common ground, waive his exclusiveism and invite him to meet him at the Lord's table,—will he admit him to the privileges which should be the common property of those who acknowledge one Lord and one faith? Here is the test of sincerity—or rather, here is the test of the strength and truth of the so-called Christian union. Will it be said that this is a subject about which all are allowed honestly to differ,—about which peculiar and exclusive views may be held? If so, then is the union, in our opinion, one of form and not of fact.

Again, the Christian ministry is overlooked to a great extent by this movement. The laity are placed in the position of those who have been solemnly set apart from the worldly pursuits of business "to wait upon and serve the Church,—to offer before Christ the prayers and supplications of His people; to feed, to instruct, to watch over and guide the sheep and lambs of His flock, whom He hath purchased with His own blood." Circumstances may arise when a godly layman should take charge of religious meetings, in case of the absence of a minister, although it is even then better that he should be an officer set apart, as the elders and deacons, in many of our churches are, by the public laying on of hands for Church work. But where an effort is specially made to put forward the layman at the expense of the minister, is it not an evil committed against the calling of the latter, against the office which Christ Himself solemnly instituted for the use of His Church? The defence is often made for this course of procedure,—that more good can be done by the layman, and that he is not suspected of interested motives in his efforts to win souls,—more confidence is reposed in him. If this be *so*, then it is high time for the ministry to be purged, and for those who are so peculiarly fitted for its duties to be fairly and in due form invested with them. Is not the possession of such peculiar qualifications for doing good a strong indication of a call to assume the position of a regular leader in the Christian army?

Another objection to this movement towards union, is, that its members becoming restive under authority, are intolerant towards those who are not operating with them in their Associations. While they virtually deny the possession of the disciplinary power to the ministry and church council, as given in those mysterious words of Christ—"Whatsoever thou shalt bind on earth, shall be bound in heaven; and whatsoever thou shalt loose on earth, shall be loosed in heaven"—they act with apparent authority in condemning those who do not use the Shibboleth of their faith as the countersign. Thus prayer was offered for the *conversion* of the author of *Mixed Societies*—a pamphlet taking ground against these Societies—shortly after its publication, at one of the meetings of such an Association. It is not an uncommon thing for the zealous, wherever found, unless held in by wholesome restraints, to forget that charity, which grants to a brother the use of his own religious views, and to pour on his head the condemnation of an enthusiasm that is approximating to bigotry. In the glow of feeling that arises from trust in God, how often are all intolerant to those, whose stand-point gives them another view of the great truths of religion and their relations to men.

But over and above these objections, is the idea of the ultimate destiny of this movement. Will it swallow up Christian denominations, cause the disappearance of even one of them? We fear not,—one of its principal oracles speaks thus* of "the new converts at Quakertown,—"already forming a true spiritual Church in Christ Jesus, and desiring to know what is now their duty in regard to outward church organization. Over their simple pulpit, it seems, was suspended the ministerial motto: 'For I determined not to know anything among you save Jesus Christ, and him crucified.' Under this banner, it was stated, they were brought to Christ; and they are ignorant of any other. * * Who shall counsel them to become Old School Presbyterians? or Baptists? or Methodists? or Episcopalians? * * As in the days of the Apostles, the Lord himself is adding unto the Church such as are saved. He makes them Christians, whole Christians, and nothing but Christians. * * They cannot bear the thought of being divided into different Denominations with opposite principles and jarring interests." He further adds, in a note, these significant sentences, which show what *his* views are with reference to "the case at Quakertown." "Surely the whole subject of Christian union contains no simpler question than this:—*How shall New Converts escape Denominational divisions, and remain united as Christians?* Thank the Lord, that this question begins to be pressed upon us!" Here we have the ultimate destiny of this movement, according to the notions of one of its friends,—the establishment of a Church which shall not be denominational but still remain Christian;—Separate from all the present Christian Churches and form another which shall not be fettered with denominational peculiarities. When the good brother succeeds in his Herculean task, he will have accomplished the greatest paradox of the age, as he will show how addition can be made to the number of sects, without investing the additional one with sectarian character.

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* Ministerial Union, pp. 34 35.

III. But a third plan of Christian Union is proposed, which looks more plausible than the two we have just noticed. Let each denomination appoint its best men to meet in solemn, prayerful conference, ready and willing to yield up all non-essentials, and to form a platform, wide and broad enough, to bear all who can be comprehended within the limits of Evangelical Christianity. Let the motto, of such a grand synodical meeting, be "*Charity*," and, under its blessed influences, something may be done towards exterminating the hydra-headed monster—sectarianism. There is that about this plan which recommends it to the kindly consideration of every Christian man. Judging by the results of Conventions, held to settle difficulties between men, companies and even governments, we might suppose that this plan would meet every hope as regards Christian Union. There is a fairness about it,—a freedom from bigotry which is really captivating to the mind wearied with the continuous warfare that brothers carry on against each other. If Christians are in earnest when they express their regret at the distracted condition of the Church, surely they will not object to a series of compromises, which will lead to a harmonious commingling of all sects. But alas! we have learned from experience that, although fair, beautiful and attractive, this plan has never produced any results at all conducing to the end after which all Christendom is longing. No mere system of compromises accompanied by alterations or intertwinings or dovetailings of creeds and symbols,--no merely mechanical plan has ever yet succeeded in bringing together the different fragments of Christianity. Nor is it possible that union, thus produced, can be permanent. There must be a living connection between a Church and its symbol, and no amount of diplomacy,—no amount of legislative tact can destroy such connection with the hope of substituting another.

The attempt in Prussia to consolidate the two great non-Romanist denominations is now beginning to show itself as a failure. Instead of extinguishing the Lutheran and Reformed Churches by the establishment of the Evangelical Church, the result is the establishment of three. Those, whose life-connection was most intimate with their Church symbols, found that this was not transferable. They could no more transfer themselves from it to another than a fish could transfer its sphere of action from water to land. Their whole spiritual being had been adapted to one element, and could not be harmoniously developed,—could not exist at all in any other. It may be said here, but the united Church of Prussia is much greater in numbers than those which thus cling with the warmth of first love to their peculiar symbols,—that these are but fragmentary portions of the great body of Protestants in Prussia, and hence this well-meant effort of the government of Prussia is in fact a success. Still such an answer cannot destroy the fact that the denominational distinctions have not been swallowed up in this effort towards union.

The defunct Triennial Convention of the Dutch Reformed and German Reformed Churches, which promised so much good, is another instance of failure at Church union. The religious bodies, here acting in good faith, recognized the same symbolical book, had many interests in common, were sister churches, reared up under the same teachings, and yet, from the very first, it was evident to the reflecting mind that the Convention-arrangement was something peculiarly mechanical,—it did not involve a life which could manifest itself in the two Churches, as though they were but different branches of one common stalk. After a short existence, this arrangement was severed to the great satisfaction of both parties, who found that no good resulted from it, while it was prolific in the engendering of strife and contention.

For a like reason, the arrangement, by which a quasi-correspondence is kept up between various religious bodies, has been productive of nothing but empty complimentary speeches and vapid expressions of general interest in each other's progress and history. The delegate makes his appearance and is admitted to a seat on the floor of the Presbytery or Synod, acts as a quiet observer for a few days and then, in a parting speech, presents the good wishes of his denomination and expresses the great pleasure the visit has given him; while the presiding officer, not to be outdone in fraternal courtesy, fully reciprocates every kind thing that has been said and officially begs that the warmest expression of interest, in the welfare of the sister Church, may be communicated by its representative. The meaningless character of this correspondence is beginning now to be understood and appreciated by those who have heretofore been most enthusiastic for it, and it is difficult to find representatives who take sufficient interest to perform the duties connected with their appointment, or even to attend the meetings of the ecclesiastical bodies. This is painful to contemplate, but surely it is better that we should abolish a relation of this kind, if its only fruit is the expression of a string of empty compliments. Let us have active, heartfelt participation, or let there be none at all. Mere compliments are nothing more than mere lies.

IV. The only ground on which Christians can meet is that of an Episcopally ordained ministry. This is urged now with great force by a large portion of the Protestant Episcopal Church of this country, and some are disposed to allow considerable latitude on matters of a rubrical nature, should the ministers of other Churches submit themselves to their ordination. "The Memorial," which was presented to the House of Bishops some years since, gave assurance that the authors were honest and sincere in their expressions of anxiety for Christian union. The House of Bishops adopted the following resolution: "*Resolved*, As the opinion of the House of Bishops, That in view of the desirableness of union among Christians, and as a pledge of willingness to communicate or receive information tending to that end; and, in order to conference, if occasion or opportunity should occur, this House will appoint, by ballot, a committee of five Bishops, as an organ of communication or conference with such Christian bodies, or individuals, as may desire it; to be entitled "The Commission on Church Unity." That, in making the above appointment, it is distinctly understood that the Commission is clothed with no authority to mature plans of unity with other Christian bodies, or to propound expositions of doctrine or discipline." Such a resolution shows that a warm feeling exists in this body, as in all others, with reference to this important subject, although, to use the words of Dr. Lewis, "*Episcopal* ordination is now, and probably ever will be, a sine qua non of union with our Protestant brethren."

Dr. Lewis, in his pamphlet on Christian Union, has set forth at full length, and with a respectful consideration for other Christian bodies, the relations of the Protestant Episcopal Church. A brief examination of the difficulties connected with this plan will show how, in the present stage of the development of the Church, it is not likely to be more successful than the other plans already discussed in this article.

First, let us see the arguments brought forward by its advocates. A few extracts from the pamphlet of Dr. Lewis will furnish these. "It is hopeless to think of a restoration of unity to the rent Church of Christ, until we can be one in regard to the ministry. It is vain to think of the world's conversion till we all become one in Christ. If we could settle upon a ministry which would satisfy all evangelical Protestants, it would leave little else in the way of unity among Protestants and put us in a position most hopeful towards Churches not Reformed." (Page 80.) "The claims of the Protestant Church in respect to the ministry are those which, in the eyes of our brethren, present the greatest obstacle to union with us; nay, they charge us with perpetuating schisms by our exclusiveness on that point. If we are conscientiously satisfied that our claims are of divine right and authority, they themselves must allow that we cannot do otherwise than maintain them. And further, if by any means they could be satisfied to receive our orders, and the unity of the Church might be restored thereby, then it is their duty to yield to us on this point, even though contented with their own ministry, and the guilt of perpetrating schisms rests on them,—not on us. If we are in conscience bound to our ordination, and they will not undertake to say that it is invalid, it belongs to them to remove the bar to union, by conceding to us a ministry which they with good conscience can receive, and we with good conscience cannot renounce." (Page 64.) "If any denomination were desirous to have a bishop or bishops consecrated from among themselves in our line of succession, to confer orders—if, for instance, the opportunity were now afforded, as when Calvin approved a moderate Episcopacy, and the leaders of Methodism desired it, we trust we could say to our brethren, 'We regard our Episcopate as a gift from Christ to the world; take it from us, and use it with no limitation from us, save that such safeguards be adopted that it be not abused to further heresy.'" (Page 76.)

Now, through all these quotations there runs an assumption that we think can hardly be accepted as susceptible of demonstration, viz: that similarity of ordination is all that is necessary to collect the scattered remnants of the Christian Church. In fact does not experience show, that this is *not* conducive in any marked way to unity. Is not the validity of ordination by presbyters admitted by nearly all non-episcopal bodies, and do not nearly all require that this should be performed with the "laying on of the hands of the presbytery?" With a ministry thus set apart for sacred purposes, so recognized that its members frequently exchange pulpits to the complete satisfaction of their congregations, do the non-episcopal bodies show any remarkable tendency to Church unity? And, on the other hand, are the bodies, who have adhered with zealous tenacity to exclusive episcopal ordination, at all distinguished for affinities drawing them closely together? We trow not. Does the Roman Catholic priest exchange duties and priestly services with the priest of the Greek Church,—or do the Episcopally ordained ministers of the Swedish Lutheran, the Moravian, and the Anglican Churches, exhibit any tendencies towards that Christian fraternization which would lead us to hope for their union? A negative answer must be given also to this question. If such be the facts in the present condition of those Churches, whose ordination is alike, how can we admit the assumption of Dr. Lewis as at all *axiomatic* in our philosophizing on this subject? Alas! even this slight hope of union is removed from us.

But, assuming that similarity of ordination *would* be promotive of Christian Union, let us now see whether his idea concerning the adoption of Episcopal ordination involves no sacrifice of principle on the part of non-Episcopal ministers, and whether "with *good conscience* they could receive" such ordination. What is involved in an admission of the *necessity* of Episcopal ordination? Nothing more and nothing less than the admission that all ministerial acts, performed by others, are null and void. Admitting the universal priesthood of believers, only the baptismal services of such ministers, as are non-Episcopally ordained, could be recognized as valid. Hence, he, who applies for Episcopal ordination, thereby publicly denies the validity of all the other ministerial services he has ever performed, including of course, as most peculiarly unjustifiable, his administration of the sacred elements at the holy communion. His special priestly functions have been so many evidences of usurpation, which he publicly avows to have been wrong, to say the least, and most probably evidences of sacrilegious desecration. Now it is perfectly clear, that there are few, if any, ministers of non-Episcopal bodies, who would be *conscientiously* prepared to make these admissions,—to avow that they had been grossly in error, even with the hope of thereby promoting, what it is not at all certain could be thus promoted, Christian Union. Such are the insuperable difficulties in the way of the adoption of the fourth plan, which prevent all hope of its ever being considered feasible. Such *re*-ordination would imply the necessity of a *re*-confirmation of all their Church-members, and, with those whose views are not sufficiently Churchly to recognize the validity of *lay*-baptism, of *re*-baptism, or, at least, of hypothetical baptism of all comprised within their congregations. We submit these difficulties to the consideration of our author, and ask whether we go too far in pronouncing them, *at present*, as insuperable.

It is true that as regards those about entering on the ministry, these objections do not hold with so much force, although even then they would be obliged to submit to *re*-confirmation, which would also imply a desertion of those principles they had hitherto held as precious and true. And young men, who would thus submit to Episcopal confirmation and ordination, would most likely elect the Episcopal Church proper as the sphere of their labors and duties, thus preventing their act having any effect at all upon the very religious bodies intended to be brought into one fold.

But, admitting the necessity of such ordination as directly promotive of Church Unity, and waiving the difficulties mentioned in the last two paragraphs, another question comes up for consideration, Why should orders be obtained from the Protestant Episcopal Church in particular? Might not the ministers of the German Churches, and more particularly those of the Lutheran Churches, say we prefer to have our ordination from that Church which approaches most nearly our own as regards the period of its secession from Rome,—we will go to Sweden, where an undoubted Episcopal succession has been preserved, and, from its bishops, we will ask this privilege, which it is alleged will cause the disappearance of divisions. Or, others of another shade of religious feeling might elect ordination at the hands of Moravian bishops, who claim continuity of succession. Or, others, again, might say, we are worn down by the trials of our position, why not go to the Romish Church, and from its authorities receive that power, which presbyterial laying on of hands will not confer. Is it not very evident that as great contrariety of action, as this, would be inevitable, even were we to admit the correctness of the author's position.

We are not blind to the great benefits which flow from Episcopal government,—how the office of bishop, in its peculiar sense as confined to one man invested with special powers and privileges over and above his fellow-ministers, may be made conducive to the support of order and discipline, the preservation of sound doctrine and the concentration of the efforts of the Church. We are not satisfied but that much of the trouble, arising from the want of such an office, in the way of the division of the Church into numerous sects, might not have measurably been avoided had its government been more generally Episcopal. We recognize, with hearty good will and thankfulness to God, the wonderful success of the Protestant Episcopal Church in this country, and would bid it God-speed in its laudable undertakings, its missionary and benevolent operations. Its past history is rich with the lives of sainted men, whose writings and deeds are the property of the Church Catholic, and its future bids us hope a continuation of its activity and energy. But we can not see how Church Unity is to be effected *now*, through an acceptance of Episcopal ordination, by those who recognize presbyterial ordination as of *equal* validity. The customs and traditions of three centuries, together with the blessings which have resulted from the ministrations of men ordained by Presbyteries,—these prevent this plan from receiving full sanction from non-Episcopalians, and show that it is likely to be of as little avail towards the desired Christian Union as the other three mentioned.

What then! are we to believe, if we admit these plans as not likely to produce Church Union, that there *must* be divisions and sections in the Church? Is there *no* hope of quieting the sect spirit? Is there *no* hope that the time may come, when, in name and feelings, in word and in deed, we may practically understand and act in accordance with Paul's words: "There is neither Jew nor Greek, there is neither bond nor free, there is neither male nor female: for ye are all ONE in Christ Jesus?" Yes! there is hope, simply because we are assured it will be so, although there may be much tribulation before such an end is attained. "The actual Church is still very far from being a perfect Church. * * As it now stands especially, the Church, with its divine life-powers, is not confined to any one organization exclusively, * * but extends its presence, with different measures of power, over different and divided communions. It has no sympathy indeed with the spirit of division and sect; but still it allows the evil to be comprehended for a time in the evolution of its life, (just as the abuses of the papacy were comprehended in it before the Reformation,) in order that all may be the more gloriously surmounted in the end."* Such words are cheering to the desponding spirit. They bid us have faith in the Providence of God as His plans are unfolded in the world, faith in History (which is nothing but the revelation of the Divine plans). There can be no forcing History to a rapid exhibition of results,—it is a process, which advances on towards its final completion, under the agency of laws above the comprehension of finite minds. No quickening means, devised by the intellect of man, can hasten this process, which proceeds slowly and measuredly with the dignity and grandeur that specially marks all the works of the Supreme Being. Let us not be disheartened and sicken at the discords of the present; they may all be necessary, as preliminaries to those grand harmonies which shall accord with the hymn that the angels sang, when the announcement of a Saviour was made to the shepherds,—they may all be employed by the Lord to redound, not only to His glory, but to the establishment of "peace on earth, good will to men." We can hope for very little from societies, associations, ecclesiastical conventions, or from the adoption of particular Church doctrines, towards Church-union. These are, after all, minor points. They do not reach the heart of the subject. They are all mechanical appliances, proposed as substitutes for that which is organic and living. We must strive to get the Church-life, the Christian faith, that which is embodied in the Creed, and then we shall find differences removed, not by conventional arrangement, but thrown off by the life-vigor that will permeate our organizations. Sects, in proportion as they learn to live and move in the Creed, will gradually approach each other in faith and practice, until at last the division walls will have so thinned away that, with the glad shouts of rejoicing believers, they shall fall, even as the walls of Jericho fell on the seventh day, after having been compassed at first in silence by the people.

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* The Church, by Rev. J. W. Nevin, D. D. 14.

In the first volume of this Review it was shown that,* "For the settlement of our existing theological and ecclesiastical difficulties, the first and most indispensable necessity is a true and hearty inward submission to the authority of the Creed, according to its original intention and design. * * The first condition of all sound theology is, active sympathy with historical Christianity, with the idea of the Church, with the Catholic mystery of the Creed. * * We must be in the Creed, and so have faith in the Church, in order to determine it, or to settle its exact form and limits." Here, then, we have an indispensable prerequisite, which, being adopted, removes grounds of dissension as to the *form* of the Church. If the faith be right, there can be no cause for discussion.

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* I. 344, 345 and 346.

It is worse than idle to permit discussion as to the proper form for the actual Church. We are not possessed now with the material for such discussion, and we can only assure ourselves that the form will be such as its nature and uses will require. Dr. Lewis himself honestly admits,† "None of us have a perfect system, whatever its excellencies, and when God shall build up again His one true Catholic Church it will probably be with materials gathered from all existing Churches."

But do the signs of the times indicate anything like an approximation towards union? We think so, and propose now to direct the attention of our readers to a feature in the present condition of Christianity which is a hopeful indication that the dawn of better things is approaching. And this feature is the wakening up of Christians to a true idea of worship, proceeding mostly from a closer study and appreciation of the Apostles' Creed.

THE LITURGICAL TENDENCIES OF THE TIMES are remarkable, in the fact that they do not rise from any particular local point and then extend by ever-enlarging circles. There is no one *focus* from whence they proceed, but numerous foci—appearing here and there in every denomination in our land. They cannot be attributed to the influence of any one school of theology, but have grown up from the necessities of the case, and have acted upon individuals, whether willing or unwilling, with such power as to cause these to demand liturgical services in some form or other. Those denominations, which sprang into existence under liturgical forms, adopting the old ones, with slight modifications, as their own peculiar birth-right, have returned to their first love, joyously fleeing from the so-called *free* worship of Puritanism to that which is less slavish because the offering of the spirit of every worshipper; and those that have been ushered into existence without such blessed privileges, begin to yearn with irrepressible desire after some liturgical character for their worship, which will enable it to be freed from the danger of taking its character from the physical condition of the minister.

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† Christian Union. 27.

The liturgical tendencies of the Present have been partly occasioned, as a species of reaction from the loose and rhetorical character which public prayers have been made to assume. The idea of prayer seems to have entirely escaped the minds of some ministers, and it is made the means of communicating truths to the congregation, of narrating events and incidents, or exhibiting rhetorical skill and *belles-lettristic* ability. Hence we have the terms familiarly employed on all sides, "*eloquent prayer*," *impressive prayer*," &c., which are specially significant, since they show that prayer is valued by its hearers on account of the rhetorical dress with which it is clad, and not because it embodies their own sense of sin, deep contrition, humble petition for forgiveness, and thanksgiving for past and present mercies. The heartfelt petition of the publican would be considered, by no means, an *eloquent* prayer at the present day, although our Lord tells us that he went down to his house *justified*.

The distinction between a prayer to the Almighty, and a sermon for the instruction of the congregation, has long since been lost with some, and both assume the character of the sermon. Mr. Spurgeon offers up,* in a prayer, "a petition for Reform, and that Parliament might be enabled not to talk but to do something." But as an illustration of the worst conception of prayer probably on record, we transcribe some extracts from one offered† "on the occasion of the funeral solemnities while the remains of Dr. Kane lay in state in the State Chamber, Columbus, O.," by a minister of the Congregational Church. We feel that we should apologize to the readers of the Review for the insertion of such material, but we wish to give a specimen of the kind of prayer which is esteemed as both eloquent and impressive. * * "We have come hither to pay our last respects to the earthly remains of one of whom when living we all had heard, and whom we had learned to love and revere. Thy thoughts are not our thoughts, nor are thy ways our ways, Lord God Almighty; thou didst hold him in thy hand when wind and waters and all nature were against him. Thou didst bear him through storm, and cold, and darkness, and famine, and fear, and didst set him down safely on the deck of the Release. And when the cheers of his countrymen welcomed him back to the social world of love which they represented, hope elevated and joy brightened his crest. Long had he trod the ice-foot in safety. Through two Arctic winters God had kept him. And in the third under the mild light of a genial clime, before the returning sun had gilded the topmast of the Advance in her ice-bound home, the floes yielded beneath his feet and he passed into the eternal sea. * * * Bear with us, O Lord, if in our addresses to thee we make mention of the virtues of him whose loss we deplore. For he acknowledged God as the author of his powers, and it was a part of his wisdom to know whose gift he was. Much had he seen, and known, and done. His feet had touched the soil of every continent on the globe, and his temples had been laved in the waters of every sea. His life was a voyage of discovery. Already the benefits of his labors are felt, more or less, in every country. His plans were original, and as full of humanity as they were of genius. He had been endowed with superior powers both of mind and body, and where others perished he survived. But the silver cord is loosed at last, the golden bowl is broken, the pitcher is broken at the fountain, and the wheel is broken at the cistern. The dust will return to the earth as it was;

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* Athenaeum. Dec. 26, 1857.

† Elder's Life of Kane. 327.

but the spirit has returned unto God who gave it. The shades of a more-than-Arctic night have settled on his dust,—a night that knows no day; but the spirit is bathing in the mellow light of day,—a day that knows no night. The Advance is in the ice, the Eric is in ashes, the Hope is on a far-distant shore, the Faith—the "precious relic"—is in possession of his country, and Kane is in heaven. He will need the craft no more, for now he walks with the Evangelists upon the crystal and stable sea." This and more, which we forbear to quote; enough has been given *usque ad nauseam;* what follows borders slightly upon the profane. Who can read this epitome of a gallant man's life and believe for one moment, unless he had been assured of the fact, that it formed part of a prayer addressed by a created being to an *Omniscient* Creator? When such material is offered from the pulpit, who dare wonder, that a people will turn, with anxious longing, to those sublime devotional forms which the early Church employed to address the throne of Mercy, and which, with slight modifications, constitute the Liturgies of the present day.

No one, who has ever studied the subject, will think for a moment that one's devotion, whether private or public, is fettered by forms. We are raised, by an honest and faithful use of these, to a height of devotion seldom attained by the use of extempore or unstudied sentences. Of course, unless the heart is warmly engaged in prayer, it matters little what may be the words that proceed from the lips,—they are but sad mockery. We think, however, when the body is worn down with fatigue and the mind is affected by this so as to be inactive and sluggish, that forms then can be employed with great comfort. The very effort to appropriate them is comforting to the wearied soul. And in the solemn Litanies of the past how peculiarly appropriate does every sentence seem to be to the case of every one using them,—commencing with the cry for mercy to the Holy Trinity, then the petitions that God would spare us from the just punishment of our sins for the sake of His most precious blood that had been shed for us, that He would deliver us from all spiritual and earthly dangers, from ecclesiastical insubordination, that He would help us and all mankind in all dangers and enable us to triumph over Satan; that He would preserve those who are in especial peril and extend His mercy to the prisoners and captives; that He would defend and provide for those who are orphaned, desolate or oppressed;—what is not included in this grand old form of supplication, and what congregation has ever, with devotional feelings, employed it without being satisfied that no words of their own could so fully express their wants and needs?

Again, we are specially warned against the use of "vain repetitions," (which are indeed more or less common in all extempore prayers) such as the heathen use "for they think that they shall be heard from their much speaking," and told to pray "*after this manner*," and the *manner* is indicated in that grandest of all prayers—the Lord's prayer, short, concise, embracing the whole circle of human wants and epitomizing all that can possibly form the material of prayer,—one of the first things taught the infant at his mother's knee, his companion through life, dearer to him with each repetition, more and more replete with meaning, comforting and solacing him in disease and distress, and making glad the hour of his departure. And why not? Are not the words those of His Saviour, who hath taught him to call the high and mighty Ruler of the universe—his Father, to whom is ascribed "the kingdom, and the power, and the glory, for ever and ever, Amen." No wonder we are told that "John Newton said, That if he could use the Lord's Prayer, entering into the spirit of every word, he should consider it as the highest devotional attainment of his life." Miss Yonge, in one of her late productions, (we can hardly call them works of fiction,—they are too true to life) sets forth the effects of the use of one petition in this prayer by the hero—a great, Christian soul—when he was suffering from the effects of malice: "as if there was power in the words alone, he forced his lips to repeat,—*Forgive us our trespasses, as we forgive them that trespass against us.* Coldly and hardly were they spoken at first: again he pronounced them, again, again,—each time the tone was softer, each time they came more from the heart. At last the remembrance of greater wrongs and worse revilings came upon him; his eyes filled with tears, the most subduing and healing of all thoughts—that of the great Example—became present to him; the foe was driven back." Has not many a man just such a scene in his past history?

In the Liturgical services that have been published for the use of different denominations, what is peculiarly remarkable in them all is the tendency to return to the forms set forth in the early Liturgies. These, as is known, were made to rest upon the Holy Communion as the greatest of all forms of worship, and those are now found to make more account of its celebration than was done years since. Committees, appointed to prepare such formulae for public worship, have willingly confessed their total unfitness for the construction of prayers and collects, which shall have the same fullness and devotional sense as those put forth by the early Church, and have felt it their great privilege to reinstate these in the position they once occupied. Those are mistaken who suppose that *new* Liturgies are new compositions,—they are simply *adaptations* of old forms to the needs and wants of the present. Dr. Lewis has fallen into such a mistake when he speaks thus of the Provisional Liturgy of the German Reformed Church,—"How can those who have prepared it suppose that they, in their studies, can mould a service to be compared with one which has grown into perfectness by the contributions, the experience, the use, the wants, the piety of nearly two thousand years?" The most important portion of this book—the Communion Service—is based upon, not the subjective notions and ideas of the Committee but the ancient Liturgies, as the most superficial examination will satisfy the reader. Besides this, the early history of this Church, after its secession from Romish rule, is peculiarly rich in Liturgies; Leo Juda prepared one in 1523,—others were set forth in 1525 and 1535 at Zurich, and the Palatiate Liturgy dates from 1563. Members of this Church are said to have been active in assisting the Committee who prepared the Book of Common Prayer, as is intimated by Daniel, in these words—Ut vulgo fertur his viris (i. e. the committee appointed by King Edward) non defuit theologorum Reformatorum *Exterorum* auctoritas atque consilium Petri Martyris, P. Fagii ac M. Buceri et Johannis a Lasco.* This is doubted by Weber, who asserts that Bucer and Martyr did not visit England until the book was completed. It is a matter of history, however, that Bucer was appointed Professor of Theology in Cambridge, 1549, and lived two years in the performance of the duties of the chair, and that his body, with that of Fagius (who had left Germany at the same time and for the same reasons"—on invitation from Cramner—)" were burned," being chained upright to a stake in the reign of Mary.† Schmidt, in his life of P. Martyr, mentions that Bucer, in company with Martyr, prepared a critique on the English book, entitled Censura super libro sacrorum. This, along with other objections, had the effect to secure alteration through a Commission named by the King, and, to use Schmidt's words‡—" Den 6 April 1552, wurde diese (the Book of Common Prayer) revidirte, dem einfachen reformirten Typus näher gebrachte Liturgie von dem Parlamente angenommen. Sie war ein bedeutender Fortschritt in dem Werke der englischen Reformation, und ein neuer Beweis von *dem Einflusse, den Martyr und Butzer auf diese ausübten*." Schmidt adds—" Die Arbeit Butzer's über die Liturgie war eines seiner letzten Werke." Thus, it will be seen that the Reformers of the Anglican and German Churches were operating, in the early history of these Churches, *harmoniously* in the preparation of liturgical services, and their descendants, employing the results of their labors, should thankfully receive the work of their hands as a most precious boon.

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* Daniel. Cod. Lit. 111 297.

† New Amer. Cyclopoedia

‡ Schmidt's P. Martyr Vermigli, 125.

Modern Liturgies, we say, are not modern compositions, nor are they reprints of the Book of Common Prayer, but all base their value upon the early forms which were prepared in those times when the Church was fully infused with the spirit of its Master and His teachings.

Another point in these Liturgies is the fact that they are more or less expositions or unfoldings of the Apostles' Creed. In the German Reformed Liturgy, this venerable symbol is placed *first*, as embodying the sum of the Christian's faith. not as set over against the Holy Scriptures, but as epitomizing that which they contain as necessary for a Christian to believe in order that he may be saved. The Church Book prepared for the use of St. Peter's (Presbyterian) church, Rochester, N. Y., in the morning service, leaves it to the discretion of the minister "to invite the congregation to stand and say with him the Creed of the Presbyterian Church in the United States of America, being that commonly called the Apostles' Creed," and requires its use in the administration of the Lord's Supper. The Liturgy of the French Protestant church, Charleston, S. C., requires the use of the Creed in the morning and evening service. The Liturgy, published by the General Synod of the Evangelical Lutheran Church in the United States, leaves it discretionary with the minister "to pronounce the Creed" in the service for the Lord's day. All these Liturgies thus show more or less tendency, not only in their forms, but in the respect and great account thus made of the Creed, towards Christian Union.

A most interesting publication proceeding from the Unitarian Church, published in 1858, would seem to show that, even there, the members were longing for something more than the dry morality which has hitherto constituted its doctrine,—were desirous of retracing their steps to the cross and *there* acknowledging the man Christ Jesus as the Son of God. We refer to the Service Book published for use in the Chapel of Harvard University. This contains full services for all the festival days, (including saints' days) of the Church year,—the unaltered Apostles' Creed, and a Communion service from the Liturgy of St. James. The mere appearance of the Apostles' Creed in a Unitarian book. is a protest against the system, and is the admission of a glorious light which must increase in brilliancy until it shall bring this body back to the precious truths involved in a recognition of the Trinity. Its repetition, in public service, will surely bring the worshipper to a serious consideration of the difference between his faith and that of the apostles, martyrs, confessors, saints, holy men and women, who while in the Church militant lived and died in full assurance ot the truth of the articles of this *Symbolum Magnum*, and who now in the Church triumphant are allowed the privilege of joining the "ten thousand times ten thousand and thousands of thousands" in saying "Worthy is the Lamb that was slain to receive power, and riches, and wisdom, and strength, and honor, and glory, and blessing." If the Creed had been preserved in all the Churches, could Unitarianism indeed have attained the numbers it now claims? Would it be possible for a people to be led off from the doctrine of the Trinity by any minister, if the Creed were recited at each public service? A child would see the inconsistency involved, and would detect the erroneous tendency. We are told that "of two hundred and sixty parishes, established in glory in the days of Cromwell, two hundred and forty are now Unitarian," and, sadder still, that the pulpit, from which John Calvin preached to a loving people, now resounds with denials of the Trinity. So long as "the form of sound words" is adhered to. so long will there be very little probability of defection from sound Christian doctrine,—so long will the centrifugal tendency of the sect-system be held in perfect equilibrium by the centripetal force that binds the believer to the great fact of the Incarnation, as beyond all question. that which must never be yielded up even though life itself be the forfeit.

The return to the use of the Creed, not, however, made dependent on the will of the officiating clergyman, but authoritatively required, must, by a natural process, lead to an acceptance of its life and spirit. He, who publicly and with a due sense of its meaning, repeats the article—I believe in the *communion* of saints—must be made to see sooner or later that such communion will not admit of a division of the Church into contending parties, and to feel that existing divisions are wrong and must decrease while the Church itself shall increase.

Liturgical worship not only allows of a more full union, on the part of the people, with the prayers of the minister, but it effectually prevents the injurious effects of any heretical notions he may entertain. The recognition of such will be easy to those who have been trained in forms, prepared in accordance with the early Church customs and formulae. A return to it is a hopeful indication at present. Those, who fear every thing that is Churchly, lest it may be Romanizing, may have their fears dispelled by reflecting on the fact that the practice of the Roman Church, in our country, is to confine the liturgical worship to the clergy and the choir;—these perform the whole service. There is a practical denial of the universal priesthood of believers,—an usurpation tion of the worship, as absolutely from the hands of the people, as is the case with some of our most unliturgical sects. The use of liturgical services by people and minister is *not* in accordance with Roman Catholic custom, but *is* in perfect accord with the custom of the early days of the Holy Catholic Church, even in its apostolic times. Moreover, the employment of the vernacular for this purpose is especially enjoined by St. Paul in his Epistle to the Corinthians, when he exhorts them "to excel to the edifying of the Church," by speaking in "a tongue easy to be understood,"—"Else when thou shalt bless with the spirit, how shall he that occupieth the room of the unlearned say *Amen* at thy giving of thanks, seeing he understandeth not what thou sayest?" (1 Cor, 14: 16.) In the Roman Church, adherence to the Latin service, and the entire use of Liturgical material by the priest and choir, constitute important differences from the Liturgical worship of such Churches as have, under faithful ministers, well-trained congregations joining, with audible voice, in the responses required by the service, thus satisfying the minister and themselves that their thoughts are not bent on criticizing the prayer but on the contents of the same. The criticism of a rough old soldier, in the Light Artillery of our Army, on the difference between a liturgical form of prayer and one of extempore origin, will show in a word the effect of the two modes of worship on the hearer. The regular Chaplain at the post was in the habit of using the Book of Common Prayer,—being obliged to be absent one Sunday, his place was filled by a brother who rejected all such helps as Liturgies might offer. After service one old soldier expressed himself somewhat as follows:—"I don't like that preacher, for when he says 'let us pray,' he means I will pray and you shall listen, but with the other preacher he means exactly what he says." Here was the difference; in the one case the hearer was obliged to use his intellect, and probably found it difficult to avoid criticizing; in the other he could accompany the minister, who was merely acting as the mouth-piece of the congregation.

But we must draw our article to a close. All mechanical plans at Christian Union, have proven themselves unfitted for the great purpose of binding the *disjecta membra* of the Church. There seems, however, to be hope that such an union will take place; but it must spring from the approximation of religious bodies in life and usages, so that at last, the necessity of separation no longer existing, they must, by a law of their own existence come together and form one harmonious body. To employ the words of an English author: "We can do nothing well till we act 'with one accord;' we can have no accord in action till we agree together in heart; we cannot agree without a supernatural influence; we cannot have a supernatural influence unless we pray for it; we cannot pray acceptably without repentance and confession." Approximation in life and usages must result from a general and devout use of the Creed with the liturgical services that necessarily arise from its employment. Our Churches at present exhibit a great interest in the subject of Liturgies and their uses, and hence we have endeavored to lead our readers to our opinion, that *in the Liturgical tendencies of the Times there is a faint foreshadowing of future Christian Union.* We cannot force the course of History. We must pray and wait. There is a *vis medicatrix ecclesiae,* which will eventually heal all wounds and throw off all excrescences, drive off morbid affections and restore healthy action. We can be as confident that the Actual Church will at one time fully embody the Ideal Church, as that

"The saints on earth and all the dead
  But *one* communion make;
All join in Christ, their living Head,
  And of His grace partake."

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VALEDICTORY ADDRESS

DELIVERED AT THE

THIRD ANNUAL COMMENCEMENT

OF THE

MARYLAND COLLEGE OF PHARMACY,

MARCH 15, 1859.

BY

LEWIS H. STEINER, A.M., M.D.,

PROFESSOR OF CHEMISTRY.

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VALEDICTORY ADDRESS.

THE PHARMACY OF TWO HUNDRED YEARS AGO, COMPARED WITH THAT OF THE PRESENT DAY.

Ladies and Gentlemen :

The nature of man is twofold. Body and spirit are both necessary to the idea of a human being,—without the latter we have mere matter—the slave of physical laws, not gifted with the power of controlling the elements, but controlled by them, without the former, there is nothing left but huge, misshappen emptiness, of which the mind can take no cognizance or acquire any conception. Hence form and spirit are necessary to each other in the conception of man. Without their presence, no adequate idea can, indeed, be acquired of anything in the realm of nature. The sacred historian informs us that, in the beginning—"the earth was without form and void, and darkness was upon the face of the deep," but when, in the council-chambers of eternity, it was determined that man should be created, that a reasoning being should be formed whose highest glory should be to magnify his Creator's name, and to praise Him from the earliest dawn of his existence to the closing moments of life,—form and shape were given to the chaotic elements, — the great beginning of time was marked by the establishment of the earth and the enactment of those laws which have regulated the same from its earliest appearance on the arena of existence. The earth was thus established, containing,

"Groves whose rich trees wept odorous gums and balm,
Others whose fruit burnish'd with golden rind
Hung amiable, Hesperian fables true,
If true, here only, and of delicious taste.
Betwixt these lawns, or level downs, and flocks
Grazing the tender herb, were interpos'd,
Or palmy hillock, or the flow'ry lap
Of some irriguous valley spread her store,
Flowers of all hue, and without thorn the rose."

And from that morning hour of time, on, through tedious minutes and slow-moving hours, until the present when the world has seemed to reach the zenith of existence, the law still remains the same that an idea does not attain its full meaning until it is enveloped in some form,—and that forms are the necessary media, by which we are enabled to bring to the comprehension of the human intellect, the spiritual meanings they are intended to convey. Whatever power disembodied spirits may have of appreciating that which is not invested with fixed and definite forms, we are happily not able to determine, but we know that man can never think of even the spiritual and eternal, without investing it with a form which may be clear, distinct and intelligible to his own mind. And thus, our ideas of the Deity himself are mainly acquired by a consideration of His embodiment in the form of the God-man, even the blessed Saviour himself; and without such an aid to the religious mind there is an almost irresistible proclivity to the worship of some awful, inexpressible and shapeless being, whose existence is terrible to the human mind.

It is easy to see, then, that there must be some form for everything which the human mind endeavors to dwell upon, and make the object of its worship or its study. And man has caught this idea, and embodied it in his pageants and ceremonies,—in his goverments and public officers. No one can doubt but that Law itself is something independent of, and above all, human representations of it. Yet mankind requires that it should be expressed in words, fitly and aptly selected, that its administration should be vested in men selected in accordance with certain, definite rules, and that it should be surrounded with insignia bringing to all minds the assurance of its power and might. We have been accustomed to such for centuries, and the very security of our personal liberty depends upon their continuance. No man would be willing to have them abrogated, and to make each individual the arbiter of right and wrong,—the judge of crime and the inflicter of its proper punishment. From this would result a state of anarchy and misrule, fatal to anything like freedom or independence of action.

In the republic of letters the same principle holds, as in the department of human law. There must be forms, which shall communicate to the external world, the acts of this republic, which shall be the embodiments of laws, and hence, while entitled to respect for the authority they convey, shall prevent unauthorized persons from wielding the privileges they confer upon the worthy and the proficient. These forms are found all through the student's life; they separate him from the professor,—invest the latter so long as he is in the professorial chair with certain peculiar privileges, separate and distinct from the learner who occupies the scholar's seat,—require that the representatives of learned institutions should subject applicants for their honors to a thorough and impartial examination before such are awarded, and finally that the award should be made in public assemblage, before their countrymen, presenting the student with the laurel wreath which his labors have deserved, making the occasion joyous with the sound of triumphant music, significant or symbolic of the future reward awaiting every useful and good man at the termination of a life of struggle, and invoking the blessing of the great Father of us all upon the labors and trials of the neophyte thus about to enter upon the struggles of life.

We need to make no apology for bringing an audience together to witness the ceremonies of an Annual Commencement. In this enlightened age, every one knows why the occasion of graduation, in any art or science, should be made public and formal. The full importance of the thing itself is thus brought to bear most strongly on the student's mind. The solemn nature of the duties that his new position will gather around him,—the gathering of his fellow-men to witness his assumption of those duties,—the solemn words of the man of God, who invokes Heaven's blessings upon his endeavors to perform them honestly and uprightly,—aye! even the sweet strains of music suggestive of those quiet and soul-enrapturing moments of rest when, in the future, he shall look back upon "a life well spent,"—all these are of magic power in impressing upon the student's mind the importance of the position he occupies and its relation to the great, busy drama of life in which all men are actors. Is not such an occasion one of significance to the student? does it not, even while the flush of victory mantles his cheek, and the flash of pride darts from his eye, indicate to him, in unmistakable language, that his future life must be one continuous effort to deserve his honors by showing the world his fitness to bear them,—that he must find in his inmost soul that:

> "Not enjoyment, and not sorrow,
> Is our destined end or way;
> But to act that each to-morrow
> Finds us farther than to-day."

For three winters, the Maryland College of Pharmacy has thrown open full courses of Lectures on subjects of importance to the students of Pharmacy. It was not upon the impulse of the moment that it instituted its course of instruction, but after calm and prudent deliberation, and in full view of the important relations the Pharmaceutist holds to the rest of the community. Pecuniary reward was no actuating motive in the determination of this action. Sense of duty and professional pride impelled them to spare no exertion, toward the proper education of those of their own calling who were called upon to act as the physician's assistants by the bedside of suffering humanity. Educational influences were being brought to bear upon all professions and trades, and they felt that such should also be called to aid in their own pursuits, and fit its followers for the duties devolving upon them. The College was opened with a discouragingly small number of students,—and the enterprize, viewed in a business light, was a failure. But there was a higher stand-point from which to view the whole; and from that, both Trustees and Faculty were taught to recognize the small beginning as of good omen. It was important that the Pharmaceutists as a body,—that this community, should recognize the necessity of College training, and it was a matter of special congratulation to find the smallest sign of such a recognition. The sign was gratifying and indicative of the dawn of better things in the future. The class, small in number, was composed of young men who felt deeply the necessity of preparing themselves for the duties of life, and the interest taken in the course of instruction gave the Faculty satisfactory proof that their labors were not thrown away. With each succeeding course of Lectures, an increased number of students has been found occupying the seats in the Lecture Room, and a spirit full of zeal and enthusiasm for thorough information has manifested itself in the members of the class. The course, which has just terminated, has been attended by more students, than either of its predecessors, and now, at its close, we are assembled to witness the award of the highest honors of the College to those whose examination has been creditably and honorably undergone. The class is not large, and the casual observer might ask whether, after all, the project of a College of Pharmacy in Baltimore has not proven a failure. We must not however base the efficiency or utility of Colleges upon the number of their graduates, but upon the value of the instruction they impart, and the qualifications of those that graduate,—upon the zeal and spirit of their students, and the effect these are producing on the community. Viewing the College of Pharmacy, in this light, we proudly say that its past career has been a success, and its future is of good promise. There is more life in the Pharmaceutic profession, in this city, now. than was ever known before,—more close and accurate knowledge of the various branches of science, required in its pursuit,—and, in consequence, a higher and more dignified appreciation of the nature and importance of Pharmacy. Indications, of the truth of this assertion, meet us on all sides, and the pages of " The Journal and Transactions of the Maryland College of Pharmacy" furnish convincing proof in the character of the original contributions, which the Pharmaceutists of this city have, from time to time, contributed. Such cheering indications bid us confidently believe that the Pharmaceutists of Baltimore will occupy that place in the van, among their brethren of the United States, that the hospitality and whole-souled liberality of the men, and the loveliness and surpassing beauty of the women of the monumental city have had assigned them, as it were by acclamation. To attain this the trammels of old forms must be thrown aside for such as are better suited to a progressive and scientific age. To use the language of the shop, the process of *Displacement* must be adopted, and the scientific extract will thus be freed from all material that might render it turbid by continuous *precipitation*. The vender of herbs that are vaunted as "*good for measles and fits*," must be driven to his hut by the mountain side,—and his place filled by one who can claim an acquaintance with the active principles of medicinal agents, and know how to compound them according to scientific rule. If the age of Nicholas Culpepper be passed away, why should the traditionary instructions received by Pharmacy from him, two hundred years ago, still linger in the shop? Why should not the stirring notes which science is sending forth, in all parts of this vast republic, be taken up by the Pharmaceutist and be made the sound cheering him on to study, and to victory over nature. Such interrogatories are receiving their proper answer at the hands of the College of Pharmacy, and we feel that the past is but an earnest of what can be done in the future. The main difficulties are in the attainment of a prudent commencement of an enterprize. *Well begun is half done.*

An occasion, like the present, cannot be passed over, however, without asking the attention of the kind friends, who are here to witness the exercises, to the consideration of some subject connected with the objects of the College. It may be well to look at the Pharmacy of two hundred years ago and compare it with its present condition. By such a contrast, we may best be enabled to judge of the contributions, which Chemistry and Natural Philosophy have made towards elucidating its mysteries, and then, how transcendently important it is that these sciences should be made the Pharmaceutist's teachers and guides. In fact we can only judge of the progress of the age in any thing by such a contrast with the past. Constant familiarity with the advantages of the present, make us forgetful that there was a time when they were not in existence.

Were we to examine the pages of History, prior to the Seventeenth Century, still greater discrepancies would strike us. We should read of a wonderful sympathetic powder, which was said to have been thus tested by Sir Kenelm Digby.* "He took a bandage which had been used by a gentleman whose hand had been wounded in a duel, and dipped it in a solution of the powder. No sooner was the bandage wet than the pain in the hand ceased; and afterwards, when Sir Kenelm took the bandage out of the solution, and hung it by the fire to dry, the gentleman suffered the most acute pain in his hand, and declared that he felt as though it were on fire. The bandage was again put into the solution and kept there till the patient recovered." This wonderful cure was effected by means of a powder made of "Roman Vitriol," beaten in a mortar, sifted in a fine sieve, "when the sun entered Leo."

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*The Cradle of the Twin Giants, I p. 117.

In those days, Medicine and Pharmacy were associated; and the same person practised both, either being knavishly inclined to deceive his fellow-men, or having gulped down, with wondrous credulity, the incongruities that ignorance had collected together, believed himself called upon to use them for the good of his fellow-men. Astrology had attained such a hold on the minds of men that it formed the basis of all medical practice. In full view of its precept the student was warned not "to give medicine, unless the moon be in a watery sign, or let a watery sign ascend, and let the moon be aspected by any planet which is direct, and if swift in motion and under the earth the better; by no means let the moon be aspected of any retrograde planet, for then the patient will be apt to vomit." Such miserable jargon forms the burthen of the therapeutic and pharmaceutic writings of those days. As we peruse the huge tomes containing them, it is difficult to imagine that the language employed is our own English,—at a period when we should be disposed to consider it undefiled or contaminated by foreign importations.

Let us take as a type of the Pharmacy of the seventeenth century,—Culpepper, who is styled by Dr. Johnson, as "the man that ranged the woods and climed the mountains in search of medicinal and salutary herbs, and who has undoubtedly merited the gratitude of posterity." It is amusing and instructive to examine the pages of the "Complete Herbal," and "English Physician." The main idea is the control of the stars over the affairs of man, and the peculiar planet, ascendant at the time of the selection of the vegetable, is supposed to govern its properties and control its action. This gave rise to a style, interesting from its complications and vague assertions,—which makes the reader marvel whether the writer is not "making game" of his credulous contemporaries. Not only is the vegetable kingdom scoured for disgusting draughts, which shall be specially potent in the treatment of disease, but the animal kingdom is taxed to the utmost to produce *materia medica* that are supposed to be endowed with wondrous curative properties. The advertisements of the modern quack, who bodly pretends "to cure all diseases," and, with a *Dulaneyian* disregard for rhetoric or English grammar, strings together the most ridiculous incongruities for the edification and wonder of his admirers—are more than equalled by the curious statements that Culpepper makes concerning the magic virtues of the animal kingdom:

"Millipedes, being bruised and mixed with wine, help the yellow jaundice;" "the flesh of vipers, being eaten, clears the sight, helps the vices of the nerves, resists poison exceedingly, neither is there any better remedy under the sun for their bitings than the head of the viper that bit you;" "*earthworms* are an admirable remedy for cut nerves being applied to the place;" the ashes of *ants*, being applied to a tooth, will cause it to fall out,—certainly a less painful operation than the use of the dentist's forceps; *oysters* applied alive to a pestilential swelling, draw the venom to them; "*swallows* being eaten, clear the sight, the ashes of them (being burnt) eaten, preserve from drunkenness, help sore throats and inflammations;" "the liver of a *frog* being dried and eaten, helps quartan agues;" "bear's grease stays the falling off of the hair,"—an idea still prevalent with the people; "*Honey* is of a gallant cleansing quality, exceedingly profitable in all inward ulcers in what part of the body soever," and "*Fox grease* helps pains in the ears." These are a small portion of the list of remedial agents, which, in that day, were employed as of special efficacy in the treatment of disease. The apothecary was expected to prepare the loathsome mixture, and his fellow-man, with remarkable patience, submitted himself to the horrors of the resulting nauseous dose. Even now *medicine* is not popular with the sick, but dare we transport ourselves to the day when *this* was the armament, with which the physician attacked disease? Imagine the grave solemnity investing his face, as he consults the astrological indications furnished by the position of the planets in the heavens at our birth, and after having obtained the decision of the stars, then orders the offensive draught. Do we wonder that such quackery should have required mystery to prevent mankind from expelling it from civilized society? It was only in darkness and ignorance that it could shoot forth and grow to such prodigious dimensions. Success made it arrogant and pretentious, and often we find curious denunciations invoked by its followers upon those who were unable to comprehend their jargon. Culpepper closes a notice of Wormwood with this precious *morceau,* which is charming to the lover of the curiosities of literature. "He that reads this, and understands what he reads, hath a jewel of more worth than a diamond; he that understands it not, is as little fit to give physick. There lies a key in these words which will unlock (if it be turned by a wise hand) the cabinet of physick: I have delivered it as plain as I durst; it is not only upon Wormwood as I wrote, but upon all plants, trees and herbs; he that understands it not, is unfit (in my opinion) to give physick. This shall live when I am dead. And thus I leave it to the world, not caring a farthing whether they like it or dislike it. The grave equals all men, and therefore shall equal me with all princes; until which time the eternal Providence is over me: Then the ill tongue of a prating fellow, or one that hath more tongue than wit, or more proud than honest, shall never trouble me. *Wisdom is justified by her children.* And so much for Wormwood."

As a necessary consequence of an absolute ignorance of Chemistry, the selection of articles to form a prescription in those days must have not only comprised a number of disgusting articles, but also substances chemically incompatible, since they fully neutralized each other. It was the age of complicated medication. The more complex the prescription, the better was it fitted for the physician's purposes. Each practitioner felt it necessary to show his own originality by adding some new article to the number of those which were required in the preparation of the popular remedy. Hence they grew wonderfully in size, and an Ossa of monstrosities was piled on a disgusting Pelion, until no witches' caldron could boast a more miscellaneous mass, even though it contained

> "Toad, that under coldest stone,
> Days and nights hast thirty one,"

And a chorus of witches had chanted around it,

> "Double, double toil and trouble;
> Fire, burn; and, cauldron, bubble."

Thus one preparation, known as *Mithridate*,* consisted of 55 ingredients, which in the form of an Electuary was considered as an antidote to all poisons, and a general remedy for all diseases, that the human flesh was heir to. Indeed the diseases for which it was said to be applicable, are as varied and different as the tissues in the animal body; and yet thousands implicitly believed in its virtues and remedial qualities.

It is readily seen that the peculiarities of the Pharmacy of the seventeenth century depended upon the ignorance of its cultivators,—an ignorance which was altogether unavoidable in the early history of an art requiring so much scientific knowledge before it could be properly prosecuted. Faulty observation or the misapplication of some whimsical theory had attributed false properties to the productions of nature. This was the first error. The second necessarily flowed from it,—that no medicine could possibly interfere with anothers action when mingled in a compound, but that if all, which were supposed to have certain therapeutic action were combined, the effect would be heightened in the cure of the disease. The

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*As a Pharmaceutic curiosity the following formula for the preparation of this Electuary is given;

"Take of Myrrh, Saffron, Agarick, Ginger, Cinnamon, Spikenard, Frankincense, Treacle, Mustard seeds, of each ten drams, the seeds of Hartwort, Opobalsamum, or Oil of Nutmegs by expression, Schenanth, Stoechas, Costus, Galbanum, Turpentine, Long Pepper, Castorium, juice of Hypocistis, Styrax, Calamitis, Opopanax, Indian leaf, or for want of it—Mace, of each an ounce, Cassia Lignea, Poley Mountain, White Pepper, Scordium, the seeds of Carrots of Crete, Carpobalsamum or Cubebs, Troch, Cypheos, Bdelium, of each seven drams, Celtic Spikenard, Gum Arabic, Macedonian Parsley, Seeds, Opium, Cardamoms the less, Fennel Seed, Gentian, red Rose leaves, Dittany of Crete, of each five drams, Annis seeds, Asarabacca, Orris, Acorus, the greater Valerian, Sagapen, of each three drams, Meum Acacia, the bellies of Scinks, the tops of St. John's Wort, of each two drams and a half, Malaga Wine, so much as is sufficient to dissolve the juices and gums, clarified Honey the treble weight of all, the Wine excepted, make them into an Electuary according to art."

Pharmacy of this period no longer numbers the educated among its cultivators, but is too often referred to with a sneer and spoken of with contempt. Let us not despise it. For all that it contained of truth has descended to our day and is conferring its benefit upon the medical practice of the present. The thick storm clouds, with their attendant flashes of startling lightning and awful peals of thunder, are required at times to freshen up the atmosphere, after a long season of drought and suffering. They are followed by those delicious mornings of summer, when the grass seems decked with a thousand gems, when the air is vocal with the melodies of countless birds and fragrant with the perfumes of the meadow flowers; and man goes forth to his daily labors with a keener relish for life and its joys. The storm clouds have been the agents of a superintending Providence, and have cleared the way for the auspicious smiles of nature. And thus it is in the intellecual world; full often when we are most disposed to despair on account of the gloomy clouds of contradiction and ignorance that cover its skies; we forget that these are but the necessary preparations for a brighter morn, when all shall become brighter and dearer and more attractive to the soul of man. The darkest hour precedes the dawn,—the period of gloom but bids us prepare for the appearance of light that shall be joyous and attractive.

The studies of the Seventeenth Century and its predecessors have not been in vain, for out of the mass of rubbish which they had accumulated many rich gems of knowledge have been gleaned, that have proved valuable to the science of our own day. Indeed it is impossible for an honest mind to devote itself to the study of any branch of science without acquiring some fact that shall be a real addition to human knowledge. Such additions become numerous, in proportion as the laborer has full light to aid him in his researches, but even a mite must not be rejected from this treasury. The vast domain of nature is laid before man for his constant study and thorough examination, and he dare not reject the labors of his forefathers, if he wishes to do his full duty. These have furnished him facts, which lead to the discovery of principles, and simple gratitude requires that the former be not disregarded, or their authors forgotten.

But what is the Pharmacy of the present day? no longer a mere art, but a science conjoined with an art,—based on strict laws, controlled by the rules of physics and chemistry, exhibiting the beautiful attractions of an architectural structure that command the eye and please the taste of the student of progress. No longer confined to the sale of inert or disgusting commodities but devoted to the extraction of the true active principles of the materia medica, to the preparation of such articles as will best fit the physician for his combat with the hydra-headed monster—disease,—it now takes its place along with those pursuits which are especially attractive to the ingenious and studious youth of our day. To the ignorant, it may appear to be conjoined with quackery in all its varied forms, but the fact is clear and unmistakable, that, in proportion as an apothecary becomes thoroughly conversant with the scientific principles of his calling, must he, if he be an honest man, feel a contempt for that brawling pretension which claims the ability to cure all diseases with any one particular remedy. If he is necessitated to keep a certain character of specific medicines, he must constantly look upon it as a disagreeable necessity, and labor hard to prepare the way for their banishment to the stygian waters of forgetfulness. In those countries where Pharmacy flourishes best, we find quackery has dwindled away so that it no longer occupies a place on the shelves of the shop. In our own land, its temporary quarters must speedily be taken from it, as the spread of science can not permit any such companionship. Its abode is most secure where ignorance reigns, where medicine is confined to routine treatment of disease, and true knowledge has not shed its benignant light. Every advance in science, is a contribution, to that low funeral sound which announces the coming of the hour of its final interment. It cannot stand the full glare of light that science sheds over the path man is treading, and hence it must ever seek the dark recesses of our country,—must fly to the owls and bats that delight in obscurity, and with such temporary companionship await its inevitable doom.

The peculiarities of the Pharmacy of the Past were the attribution of false or imaginary properties to the materia medica, and the after improper admixture of these in the preparation of remedies. Let us see how the Pharmacy of the present differs from that of the past in these two points.

I. The application of a better knowledge of Chemistry has taught the student of nature that the active properties of medicines are mostly resident in some special principles, which make up but a small percentage of their weight or volume. With this idea before him, he labors to detect the principle that may be the source of activity in each,—to determine the best mode of extracting it from the mass of other material, that is medically inert, and to test fully its properties therapeutically and chemically. The result of this has been to banish huge doses from the sick room, to furnish the physician with medicines in a concentrated form, so that all their action can be had in the shortest possible time. Not only has this resulted, but such medicines are prescribed with more certainty by the Physician, as he knows that he can rely upon their strength.

In this sphere of usefulness the pharmaceutist has but commenced his labors. Already over a hundred alkaloidal and other principles have been detected as embodying the active properties of his drugs,—but a vast field for careful research and honest toil lies before him, claiming all the energy and enthusiasm of youth in its proper cultivation. Here are to be found more attractive objects for study and diligent investigation than in the preparation of quack remedies and the profits resulting from their sale. Honor, professional pride, a desire to do something for the good of his fellow men, the promptings of an inquisitive mind, the love of science, keen sense of his religious duty to increase the sum of human knowledge,—all these call upon the pharmaceutist to labor in this field.

The discovery of these proximate principles has dealt a death-blow to that form of quackery, which has boasted of the minuteness of the dose in which it administered its medicaments, claiming that by dilution increase of strength is attained. Such a death-blow has been given, inasmuch, as chemistry has shown that *when* the active principle is obtained, diminution of dose only produces diminished effect, as our common sense had long since taught us. The pillule of strychnia or morphia is not administered because a larger quantity would be of less efficacy or potency, but because it would be endowed with *deadly* power. A small quantity is employed in consequence of the strength of the agent when used in larger dose, and not because power has has been gained by the division.

II. Pharmacy has learned what medicines are chemically incompatible with each other, and thus avoiding the formation of inert substances in the articles prepared for the sick, has simplified the remedies prescribed by the physician. While complexity is a striking characteristic of the remedies employed in past centuries, simplicity, on the other hand, marks those of the present day. Medicinal agents are not only selected with reference to their action on disease, but also with reference to their action on each other. Should they combine together so as to produce inert compounds, it would be useless to administer them to the sick. Such an interrogatory must be asked by every physician as to the articles entering into the composition of his prescription, and the chemical pharmaceutist must supply him with the proper answer, from his own previous investigations.

The age of huge, lumbering prescriptions has passed away, and no more is heard of the Mithridate Electuary or of Venice Treacle, except in the shop of some venerable apothecary, on whose skirts a strong odor of Alchemy and Astrology still lingers with wondrous pertinacity,—whose mental constitution having been attuned to the past, can work in no sort of harmony with the accords of the present, and whose pretensions to the name of pharmaceutist are a libel upon the whole profession.

We have been able to cast only a superficial glance at the condition of the Present of Pharmacy, but it has been enough to show how encouraging are the prospects before us. It is a profession now that calls for the undivided energies of its members. No study that they can undertake, can well be out of place, especially if it have to do with the wonders of nature. The mineral kingdom opens up its vast resources and bids it take that which may prove efficient and useful, furnishes deadly poisons and the agents by which these may be made innocuous and harmless; the whole domain of the vegetable world is replete with healthy balsams, and restorative agents, and every breath of air wafted across the meadows brings, with it, the odor of something that may prove useful in the treatment of disease. The keys to this treasury are furnished by Chemistry, and he, that will, may enter and draw forth inestimable treasures from the stores of nature.

The pharmaceutical profession is one of honor ; standing between the physician and the remedies which he asks at nature's hands, the pharmaceutist is, at the same time, aiding in that highest act of human philanthropy—rendering assistance to suffering humanity,—doing one of the tasks which has been confided to his race—subduing nature to his behests. Let him feel the dignity of his calling,—let him understand the importance of the duties that devolve upon him, and he must feel that every motive that can impel an honorable, christian man —to labor uprightly and conscientiously is especially urgent upon him. All the rewards that might be attained by a trifling flirtation with the meretricious form of Quackery, are as nothing when compared with the depth of true love which a proper view of the chastity and purity of science will excite in his bosom.

But as the elevation of our associates intellectually and socially is a proper subject for every man's ambition, we claim that our College of Pharmacy, whose sole object may be considered the intellectual improvement of the cultivators of Pharmacy, should receive the warmest and most zealous support from the Apothecaries of Baltimore. Through its agency, vacancies in the ranks will be filled by youths who have been properly trained and drilled in the service, who have been taught, in the lecture-room, to scan carefully the results and processes of the laboratory,—to institute new investigations for themselves,—to bring life and activity to the daily routine of their duties,—and to labor for the honor of their brethren and the advancement of their chosen calling. Through its agency, a line will be drawn—separating the ignorant drug-vender, from the accomplished master of his art, showing the public, the obloquy and contempt which the former deserves, and the honorable success which belongs to the latter. The day has past when blind ignorance can be tolerated in any pursuit, if the lamp of truth is to be had for the illumination of its intricate recesses. We claim therefore, Apothecaries of Baltimore, all your sympathies and enthusiasm for our work. Your own honor and pride demand it,—humanity itself, at the mercy of the Apothecary to a great extent, demands it,—and every thing that is sacred imposed upon you in the form of duty requires that you should aid in the efforts now made to put your profession in the most useful position in our community. You have thus far not been derelict of duty,—let not your efforts flag in the future, and it will need no prophetic spirit to assure you that generations, yet unborn, will be heartily grateful for your efforts to protect them from the effects of ignorance and stupidity, to aid the physician in his efforts to alleviate disease. There are laurels to be won in other ways than on the battle-field,—there are crowns to be gained, by the faithful laborer, wherever he may prosecute his honest toil. There are rewards to be attained which are far above all that money or public office can confer. These are all before you,—are before *every one* who labors for the good of his fellow-men.

But, gentlemen graduates, I must not forget that a few words are yours on this occasion,—and not the less are you entitled to them because of the smallness of your number. I have been selected by the authorities of the College to pronounce the final word that shall sever the relation of teacher and pupil, that shall bring out, in some way, to you the significance of this occasion,—this *Commencement* of a new era in your existence,—this beginning of responsibility of a higher order than you have yet incurred. A few words then, in conclusion, as to your duties.

The occasion of an Annual Commencement is not designed I take it, merely for the exhibition of rhetoric on the part of a speaker or even for the performance of attractive music from those skilled in the production of sweet and harmonious sounds. There is in it a significance, which would remain, although the occasion should be devoid of speech and music. It is not the mere award of honor for diligent and attentive study in the past. There is about it something higher and of greater importance even than this. Every reward obtained by a man, fastens the obligation on him to labor with renewed efforts to show the world that he has deserved it. The presentation of a sword to the soldier, for gallant conduct on the field of battle, does not free him from the duty of continuing to exhibit such and even greater bravery whenever occasion may require,—it certainly does not free him from public indignation, should he act the coward's part, afterwards, when danger threatens. So with the student who has finished his collegiate course. The award of the diploma does not confer the privilege of future indolence,—does not in any manner justify a lapse into ignorance or stupidity. No! it imposes upon him the necessity of doing more in the future than the past,—it requires him to push forward with renewed vigor towards the attainment of the highest possible acquaintance with those very subjects, for proficiency in which he has been honored. If he fall back,—if he prove the coward afterwards,—the cowardice will only be the more disgraceful since the world has been induced to believe by his early promise, that he had the true mettle in him.

Now in order to make the responsibility, which the diploma thus imposes on a man, the more deeply felt, it is right and proper that the commencement of this responsibility should occur in the presence of his fellow-citizens. The publicity of the act brings home, to the inmost soul, its full meaning and value. Henceforth, young gentlemen, you must feel bound to labor with all your might, in the cause you have adopted as your own. The first step has been attained,—you have been crowned with the honors of the College. These impose on you labor and toil; and these you publicly accept as your duty. There are those here who will recollect this occasion, and others will know of the transactions of this night,—and now what remains for you, but a cheerful and zealous effort to accomplish what you have thus publicly assumed.

I congratulate you on the termination of your Collegiate life with so much credit. The Board of Trustees have endorsed your fitness for the practice of Pharmacy; and the audience here assembled does you the compliment of welcoming you to your new labors. The scene before me is one calculated to make a young man's breast swell with delight: the grave and aged have come from their comfortable firesides to express their approval, the active and energetic citizen has not thought it a misspent hour to be with us this evening,—and many of that better and fairer portion of the human race—without whose smiles and cherished words life would often be a gloomy road—are here also to bid you God speed. It may be that some heart beats with more than usual quickness at the thought of your success this evening, and timidly but still joyously looks forth to the time when she will have the right to cheer you on the road of life, to be your helper, your consolation, your all of human joy. I charge you, young gentlemen, as you respect the approbation of your fellowmen, the good opinion of your fair country-women, the happiness of your future partner for life,—as you feel the claims of your responsibility to your fellowmen, yourselves and your God, to spare no exertion,—no labor to acquit yourselves honorably in your callings. Work while it is day for "the night cometh when no man can work."

In the past, much Quackery has been associated with Pharmacy, indeed the two were at one time, as we have seen, hardly to be considered as differing in any feature. Science has invested your calling with truth,—do not disgrace her by any association with the painted face and meretricious form of Quackery. "She is without, now in the streets, and lieth in wait at every corner." Flee from her, as from a contaminating pestilence,—have no association with that which is deceptive and dishonorable. In the words of the wise man—"Say unto wisdom, Thou art my sister; and call understanding thy kinswoman; That they may keep thee from the strange woman, from the stranger which flattereth with her words."

It is a noble and good thing to resist temptations to enter into a compromise with wrong. The mind acquires strength in this way, that enables it to overcome each successive temptation with more and more ease. But when the Rubicon, that divides truth and error, is once crossed, the return is a task of giant magnitude, which increases each day in difficulty until the mind is enveloped in error and has lost, for ever, the truth, which was its birthright. Strive to steer clear from the rocks of error and the quicksands of Quackery, as you guide your frail barks adown the stream of life. The reward of a clear conscience is more than sufficient to repay you for all the labor encountered in such an effort.

But, gentlemen, you will need more than human strength to accomplish the work I have hinted at, and your soul may well shudder at the thought of the task that you have this evening voluntarily assumed. There is, however, a source of strength which is attainable by the sincere and diligent seeker for it,—a perennial fountain of life-giving vigor. There is a balm for every wounded heart, a cordial that will send life and strength and courage through all portions of your being,—and this is furnished by the great Physician of souls, who sells without money and without price. Enlist under His banner, and all the temptations of evil, the allurements of vice and the malicious tricks of the devil, shall prove of no avail against the armour you will bear. Under that banner, you can fight "the good fight of faith," and confidently await "the crown of righteousness" which will be awarded at the great "Commencement Day," when not only rewards, but also punishments shall be assigned.

And now it remains for me to break the connection which has, for two sessions, existed between us, and in employing that word of sad sound and mournful import, necessary for the purpose, let me tender to you the well wishes of the Trustees and Faculty of the College, with their hopes that your future lives may be marked with success and honor, and that you may so live, that at the close of life, your farewell to this world will be a joyous entrance upon an eternity of happiness. With assurances of warmest regard and hearty congratulations we say "FAREWELL."

ORATION

BEFORE THE

Medical and Surgical Society

OF BALTIMORE,

AT ITS

FOURTH ANNIVERSARY MEETING,

January 17, 1859,

BY

LEWIS H. STEINER, M. D.

BALTIMORE:
PRINTED BY JOHN D. TOY.
1859.

Baltimore, January 17th, 1859.

Dear Sir,

The undersigned were appointed a Committee by the Medical and Surgical Society of Baltimore, to request for publication, a copy of the very interesting and appropriate Address delivered by you at their Anniversary Meeting. Hoping that you may be able to gratify their wishes, we remain,

Respectfully yours, &c.

JOHN F. MONMONNIER,
J. J. R. KROZER,
W. G. SMULL,
Committee.

To Dr. Lewis H. Steiner.

Baltimore, January 17, 1859.

Gentlemen,

I acknowledge the receipt of yours of this date, requesting, in the name of the Society you represent, a copy of the Address I had the honor of delivering this Evening. As the Address was prepared at the request of the Society, it is subject to your disposal.

With best wishes for the success of the Society,

I have the honor to be, yours, &c.

LEWIS H. STEINER.

Drs. J. F. Monmonnier,
J. J. R. Krozer,
W. G. Smull.

Society for the History
of the Germans,
IN MARYLAND.

ORATION.

Mr. President and Gentlemen:

In accepting the position, which your kind preference has given me this evening, I have not been unmindful of the difficulties attendant upon the preparation of a discourse, worthy of the character of the Medical and Surgical Society, and yet not dissonant with the festive character of this Anniversary Meeting. It is a rare thing for members of our profession, to cast aside the cares and annoyances incident to its practice, and to meet together for the exchange of friendly courtesies,—to clasp a brother's hand with a warmth and geniality that will cause the blood to flow gaily through its appointed channels. All this is interdicted by the special character of their engagements, which separate them from their brethren and make their lives, to a certain extent, scenes of solitary toil amid wretchedness, misery and woe. But when the physician has met his brethren for such purposes, as are involved in the present meeting, let not the hour be spent in grave discussion of science, in attempts at the discovery of the secrets of pathological troubles, or even in debates as to the efficacy of new remedial agents. Away with all these heavy questions, they will interfere with digestion and will mar the pleasure of the evening.* You will permit me to select a subject, which, although of interest to us all, yet has a ridiculous side that makes it suitable for discussion at a supper table.

The great Epic poet of the Romans began his Æneid with "Arms and the man I sing," and, with your permission, the brevity of such an introduction shall be imitated by me to night, by simply announcing that "Quacks and their Success" is the subject of my discourse. An examination is proposed into the causes of this success,—hoping to make such an examination with the kindest feelings and most good-natured strictures on what is an evil somewhat peculiar to our age.

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* The Oration was delivered at the annual supper.

Quackery, wherever found, is based upon a *misapplication* of some principle or fact, and hence invariably presupposes the existence of a modicum of Truth as its starting point. Just as the counterfeit coin has a certain value, with the unwary, on account of its resemblance to that which is genuine, to which value has been given by legal enactment, so all Quackery must proceed from a misapplication of a known truth, or an attempted imitation of this truth in various forms. The counterfeit presupposes the existence of a genuine coin, and were the latter deprived of its value, the former would, from necessity, cease to be a means of deception to the world. Thus Quackery is one of the strongest arguments in favor of the existence of true, sound Medical Philosophy, striking its roots far down in the earliest history of mankind, and having grown up, under the auspices of giant minds, until, as the stately tree, it fills the observer with feelings of the deepest admiration. Just as the feeble *jets d'eau* of art may for the moment attract our attention by the spray they shower on all sides from their, not ungraceful, columns of water, and from the miniature rainbows which nature's sun paints by means of their tiny drops,—just as these remind the lover of nature that they are pitiful imitations of mighty geysers and fountains that its energies is producing for the bewilderment of man,—so whatever of good and truth may shine forth in the various systems of Quackery is but an imitation or a misapplication of that which is inherent to sound Medical Philosophy.

If then Quackery, by its very existence, proves that there is something real and true in Medicine, it follows, as a necessary consequence, that it could not exist unless it possessed *some* truth as its starting point. Hence it must not be considered as a baseless fabric or an empty lie, but rather as the gaudy and meretricious adornment of a truth which has thus become perverted from its legitimate uses and prostituted to ignoble and improper uses. From such a view of its nature, we will not lightly cast aside, with contempt, every form this modern Proteus may assume, but will rather feel it our duty to tear off the specious garb,—to throw away the husk to the swine and, grasping whatever truth it may contain, appropriate it to the use of our profession and of mankind. By pursuing an opposite course, violence is done to all right and justice on our side, and the result is that the advocates of the Quackery we are combatting, instead of being overthrown by our weapons, raise the cry of persecution—a cry always provoking respectful attention and attracting crowds of chivalric helpers,—and many partizan friends are added to their numbers. This must be the result, since mankind are always pleased with truth if it is invested with brilliant colors, and when any thing containing truth, thus attractively arrayed, is inveighed against by the Medical Profession which desires to destroy the accompanying errors,—then the world with a morbid sentimentality clings to that which is so violently treated and gulps down, with most excellent pharyngeal extension, all the error on account of the little truth it envelopes.

But I find that I am anticipating the regular logical developement of my subject. Let us define Medical Quackery. It has become a sort of vague term, with the world,—unaccompanied by a clear idea as to its true and legitimate meaning. It has been applied to every thing proceeding from an extra-professional source, whereas very often with those who can shout the shibboleth of the profession—can brandish the parchment diploma that constitutes them Doctors of Medicine—in sober truth, if the charge of Quackery were adduced, they would be compelled, at the forum of conscience at least, to plead *guilty* and throw themselves on the mercy of the Court.

Medical Quackery may be defined as that mode of practising Medicine, which takes one idea and applies it to all kinds of disease without reference to their origin, or administers one remedy for all possible diseases. The primitive notion of the nature of the disease, or of the applicability of the remedy, must be based on truth. Thus that quasi-system, which denominates itself Hydropathy, takes its start and derives all its claims to our respect from the therapeutic qualities of water as a tonic application in certain forms of disease. This is a *fact* incontestible. It has been made known, to the profession and the world, by an experience of centuries. But the builders of this one fact into a system, have acted on the idea that what is applicable to one disease is *per consequence* applicable to all—an idea, in its very essence, most palpably and glaringly false, entitled to no more respect than the declaration of the notorious Sam Patch that "some things could be done as well as others." It arises from the ignorance of the father of the system as to the manifold nature of disease and the tissues of the body which are attacked by it.

Again; Homeoquackery, in the hands of its founder Hahnemann, had some truth as its basis, but, by a false syllogism—an illogical induction—it was arrayed in all the stately and imposing grandeur of a system—unable to accomplish a tithe of its pretensions. Because certain medicinal agents, in large quantities, produce effects on the system, somewhat resembling the very disease which these agents in smaller quantities were known to benefit,—the conclusion was deduced from a few instances of this kind—and these cases not the best authenticated—that *all* disease must be curable through the administration of substances which would produce similar effects on the human system. Admitting, for the sake of argument, that the instances cited are correct, yet that induction is far too sweeping which is based on so small a number of particulars. We deny, however, that the instances cited are correct, since the mere appearance of certain signs of disease, coincident with the administration of certain agents does not establish a relation of cause and effect; and thus one of the corner stones of the system, which claims as its motto—*similia a similibus curantur,* is shown to be unsafe. But the system finds its greatest peculiarity in the mode it administers medicine—in infinitesimally small quantities. Here is a gleam of truth. Medicines had been administered in too herculean doses, for the necessity of disease, during centuries; only a certain amount is required to produce their therapeutic action—all above this injures the animal system. The error of the followers of this School consists in their rushing to the other extreme, having cleared the dangers of Scylla they are wrecked on Charybdis;—finding that diminution of quantity increased the efficacy of the medicine in consequence of an avoidance of the injuries of an overdose, they overlooked the limits of this diminution and boldly declared that the benefits of medicine increased, inversely with the amount administered, *ad infinitum.* The truth underlying this avowed principle of Homeoquackery demands our respect;—when it is warped from its real significance by the Homeoquack then its proper meed is ridicule. He knows that it cannot be defended by argument, and hence takes refuge in the general tower of defence of all Quackery—boasts of the *success* of his practice and thus endeavors to deceive the senses where the intellect reveals nought but silly, childlike *misapplications* of truth.

Routine treatment of disease by the Profession,—that is the treatment of disease in accordance with the name by which the physician recognizes it, instead of the treatment of the symptoms presented in the case—this also smacks strongly of Quackery. An effort is made to force every disease to comply with the precise dimensions of the Procrustean bed, that has been assigned it in nosological arrangements. But though one crystal may resemble another in all the physical qualities appertaining to crystals, yet disease follows a different rule in this respect or, rather, seemingly sets all rules at defiance. There are no two cases of disease exactly alike,—some modification, produced by constitution, temperament, condition of the body or external circumstances, always exists, and each case thus becomes, as it were, *sui generis.* Wherever disease is treated alone in accordance with Nosology—that is, given the name, there must be employed the plan of treatment attached to that name—we have a false Medical Philosophy—a strong savor of Quackery. Indeed it smells as strongly of Quackery, as that treatment which is based on the administration of one remedy for all diseases, because it was found really useful in one. Quackery *in* the profession neglects attention to the different forms assumed by disease, ignores differences in the constitution, temperament, &c., of invalids, and treats each patient as though he were a fac simile of some normal type from which no alteration was possible. It is evident that this is all wrong, since the modifying circumstances of each case require that its treatment should be based on the character of the symptoms and not on the name of the disease,—should be comprehensive in its character and, with full consideration of the changing nature of symptoms, be adapted to the wants of the case as fully as the treasury of the Materia Medica will permit.

Moliere exhibits a keen appreciation of the ridiculous character of routine practice in his day, in the closing part of Le Malade Imaginaire, where the nature of the examination of an applicant for the doctorate is thus burlesqued. The Examiners, with all pomp and dignity, ask—

"Cum permissione domini præsidis,
Doctissimæ Facultatis,
Et totius his nostris actis
Companiæ assistantis,
Domandabo tibi, docte bacheliere,
Quæ sunt remedia
Quæ, in maladia
Dite hydropisia
Convenit facere!"

And the candidate answers—

"Clysterium donare,
Postea seignare
Ensuita purgare,"

And this answer is furnished as to the treatment of a variety of diseases, which are brought forth by the learned examiners to test the candidate's knowledge. Finally, however, the question is propounded, what should be done if the opinionated invalid wouldn't get well, when the answer is repeated, as before, with an appendix showing his unshaken belief in the virtue of his treatment;

"Clysterium donare,
Postea seignare,
Ensuita purgare,
Reseignare, repurgare et reclysterisare."

The delighted board of examiners cry out in full chorus;

> "Vivat, vivat, vivat, vivat, cent fois vivat,
> Novus doctor, qui tam bene parlat;
> Mille, mille annis, et manget et bibat,
> Et seignet et tuat!"

Thus far I have considered the subject of Quackery as existing in honest minds, the result of ignorance of those strict logical rules that enable us to apply known facts to our studies and to the needs of our time. The Quackery is not intentional. Indeed, systems of extra-professional Quackery have not, as a general thing, originated in a desire to delude or deceive mankind. Most often they have had their origin in a sincere desire to benefit the race, which the originators endeavored to effect by using means they had found, or known, to be serviceable under certain circumstances. The merit of sincerity can consequently be freely admitted in such cases. Where, however, systems arise or are carried out, through the boasting pretensions of the mere charlatan, who clothes his ignorance in high sounding verbosity, no claim to our respect can be lodged in consequence of the truth involved, nor, on the other hand, is there any reason why we should sally out—Don Quixotte-like, sword-in-hand—to attack the wind-mills which keep up the roaring noise and continuous whirring about our ears. It is far better to let them alone. The wind must cease its blowing,—a calm will sooner or later come,—and the noise of these disturbers of the peace will be hushed into quietness. Who can touch pitch without being defiled,—who has ever ventured into an open contest with Quackery in the world, without receiving much filth and no honor in the combat. It becomes us rather, by our knowledge and practice, to show the world that there is something infinitely superior to mere empty pretensions,—something better in an acquaintance with the true science of Medicine than in a familiarity with all the Quack remedies that have ever been prescribed from the earliest period of time down to the present hour, not even excepting Hoofland's German Bitters, Hobensack's Liver Pills, or the preparations of "the retired physician," whose "sands of life" require so long a time "to run" entirely out.

The latter form of Quackery, or rather method of practising and disseminating Quackery finds its cultivators among those who know well how to fill their pockets at the expense of public credulity. In a notice of Quacks, we must necessarily separate this class from the other, to which we have admitted the existence of a sincere belief in the efficacy of the compounds offered by it to the public. In doing this, I wish it distinctly understood that, I do not intend to designate, by name, any members of either class, giving no opinion as to merit, on the score of sincerity, between the pretensions of "*Old Jacob Townsend*" and his rival "*Dr. S. P. Townsend*" of Sarsaparilla memory, or between any other representatives of "old fogydom" or "thriving young America" in the army of Quackery. I propose describing the genera, embraced in the Class *Quack* and Order *Medical*,—leaving to every one the selection of the particular individuals belonging to either genus.

I. *The honest or sincere Quack.* He may spring from humble origin, be devoid of all educational or social refinement, or he may have been brought up under the full blaze of knowledge, have had his mind stored with the lore of Theology, the contents of Law's musty tomes, or the practical hints of Medicine. In the former case, his lack of knowledge leads him to misapprehend the true relation of cause and effect,—to be ignorant of the fact that a sequence is not a consequence. From the want of knowledge he fails, likewise, to recognize the difference between diseases to which he applies the same remedies, under the idea—to use a common phrase—that what is good for one is good for all. Sometimes, indeed, there may be a certain amount of education, but it has had no reference to the subjects of Physiology or Pathology, or to the therapeutic actions of medicines, and the party concerned becomes as blind a believer in the *post hoc ergo propter hoc* doctrine, as his brother born and bred in the darkness of ignorance. Even clergymen and lawyers, confidently believing that certain substances,—certain compounds (of whose constituents they are absolutely ignorant) have been beneficial to them since such were taken antecedent to their relief from disease,—hesitate not to assert the efficacy of such compounds, and to prescribe them, with great readiness to their friends, for all diseases to which our flesh is heir. Nay, they sometimes think it a most solemn duty to pay a visit to a sick friend, and, without a moment's reflection as to the discourteous nature of such conduct to the attending physician, to recommend the use of their favorite remedy with the most solemn assurances of their belief in its capability of effecting a cure.

To this genus of Quacks, we must add the Physician, who may understand the nature of disease and the therapeutic value of remedies, but who, on account of an attachment to a special system, follows strictly a routine course of treatment, not considering the different circumstances that must attend every case of disease.

Now, these men cannot be branded as impostors, although they are undoubtedly Quacks, resulting always from want of knowledge. The caviller may say here: "what! you must be *bold* sir! to say that the Hon. Vociferous Smith, who has represented his district twice in Congress and is now in the Senate, who has been considered one of the finest linguists and belles-lettres scholars of the present day, is defective in knowledge simply because he has found the Electric-Sugar-coated Pills useful in disease and has deemed it incumbent on him to recommend them to the public in a card;" or perhaps he may exclaim; "you are mad, to say that the Rev. Boanerges Noakes—the light of our Church—is expressing his opinion ignorantly on the subject, when he recommends Baron Munchausen's Dead Shot for Worms;" or he may whisper gently in our ears; "take care,—don't be presumptuous,—you are young, and should not charge Dr. Hippocrates Bolus with want of knowledge because he has always begun his treatment of Pneumonia with ten grains of Calomel and ten of Jalap, and has done this so successfully for thirty odd years as to have acquired the name of "*old ten and ten.*" With all due respect then to the learning and position politically of the Hon. Vociferous

Smith, to the piety and eloquence of the Rev. Boanerges Noakes, and to the hoary-headed experience of Dr. Bolus,—and notwithstanding the complimentary adjectives of "bold," "mad" and "presumptuous" stare us in the face, we hesitate not to say that each one of them is aiding and abetting the cause of Quackery, and is doing it either from a want of knowledge or a misapplication of his knowledge, in consequence of the adoption of some theory which has obscured his mental vision. Actually they are doing exactly what poor John Smith, in the mountain, does when he recommends his "yarb teas" for all kinds of fevers, and are like the Lord on the battle field who told Hotspur, that

> "the sovereign'st thing on Earth
> Was parmaceti, for an inward bruise."

II. *The Impostor Quack.* Here the subject swells to immense importance. No show of sincerity gilds the quackery of this class of personages. These seize the truths that form the underlying stratum of Quack systems or Quack applications, without any belief in their applicability to the cure of diseases, and with an eye single to the accumulation of wealth. In the manufacture of their nostrums, it is not necessary that any thing useful should form part of the composition, for what is defective, in this particular, is made up by the loud-sounding assertions of the vendor. The columns of our newspapers teem with advertisements, in which rhetoric seems to exhaust itself in sounding forth the virtues of Panacea, Vermifuge, Syrup or Liniment, with huge, lumbering adjectives prefixed in such a way as to attract the unwary and induce them to purchase. The inflated style pervading this class of advertisements would make us believe that the bag, which Æolus gave to his travelling friend, containing the winds closely confined, had been gained possession of by the nostrum-vendors, and that all the winds rushing out at once were disposed to sound forth the merits of their specifics to all quarters of the world. Truly has it been said, *sermo datur omnibus, animi sapientia paucis,*—speech is granted to every one, wisdom but to few.

These advertisements bear, on their face, " the mark of the beast,'' since they conjoin diseases, for which their compounds are said to be specific, that have no affinity whatever,—springing from totally different causes, existing in different tissues and indeed having no resemblance. Consumption, Asthma, Ague, Tic Douloureux, Stone, Constipation of Bowels and Dysentery, Scrofula, Fits and Worms, are some of the diseases and affections, for which certain Pills of a world-wide notoriety are said by their London manufacturer to be specially useful. Considered along with their efficacy, the astonishing virtues of Rabelais' sheep sinks into insignificance, and he boasts that, ''the doctors in their country made pills of the sheep's dung that would cure seventy-eight kinds of diseases,''—and that if ''one of the horns were taken and brayed a little with an iron pestle, or with an andiron, since it was all one, and then buried wherever you will, provided it be where the sun shine and they be watered frequently, in a few months you will have the best Asparagus in the world.''

The misery of all this is, that we find, staring us in the face, the announcement that the proprietor of the nostrum is a regular graduate of a medical college, who will be pleased to exhibit Diplomas, from some half dozen different respectable institutions, to such persons as may doubt his being a Doctor by right. This is then employed as an argument in his favor by some, while by others it is considered a proof that medical colleges are degenerating, and not to be compared with those of past years. It is with pleasure we can meet the latter charge and proudly point out, on the page that records the medical history of the present, names as bright as any that have been inscribed on the pages of the past,—men, whose good deeds have not ''been interred with their bones,'' and whose evil ones have been overlooked on account of the brilliancy of the good,—who have filled the chairs of our Medical Colleges, and have graduated within their walls. Impostors have ever crept in where any thing has been attempted on a large scale by mankind. They have imposed on the examiners of Medical Schools and have obtained, in this way, Diplomas far more frequently, we sincerely believe, than such have been secured in the way of mere barter or sale. Such things are however not peculiar to this country. Men with the endorsement of prominent institutions in France, Germany and Great Britain, are to be found among the veriest impostors of the age, rivalling all the ingenuity of the Yankee in their efforts to puff themselves and their preparations into notice. It is true some schools may be found, with greater regard to large receipts arising from hosts of graduates, than to their own reputation arising from the competency of the latter. But this is not a peculiarity of our age. Such things were done centuries ago, and hence it is not just that the Schools of the Present should be taunted with inferiority to those of the Past because they have unfortunately copied some of their bad habits. As far back as the beginning of the Sixteenth Century it is said,* that "the faculty of Orange (France) admitted ignorant pretenders, as doctors of physic, not only without examining, but even without seeing them." They were however brought to a sense of the contemptible nature of their conduct by that wag—Rabelais, "who sent the usual fees, and had one received doctor there unseen, by the name of Doctor Johannes Caballus, and let the wise professors and the world know afterwards, what a worthy member they had admitted into their body, since that very doctor was his Jack-ass."

The impostor is one of the vilest excrescences on the body politic, and, like some tumors, the more it is irritated the more rapid and luxuriantly does it grow. He must have a singular combination of qualities,—a harmonious adaptation of plausibilities that shall cover up his deceptions as effectually as his sugar-coating conceals the compounds over which it is spread. No truth, that may be the origin or basis of a nostrum or system he has determined to push forward under his auspices, owes its paternity to him. Truths are honestly used by the first class, already described, who sincerely labor for the good of their kind. But the impostor knows no scruples. He is a "man of energy." If cases of cures cannot be procured to defend the claims of his nostrums, he does not hesitate to manufacture such, and, with the lungs of a Boanerges, to proclaim their merits through the length and breadth of the land.

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* Rabelais I. 11.

If want of knowledge, or ignorance of its true application be the prominent feature in the first genus of Quacks, *audacity* occupies the same position in the second genus. "Dare every thing" is its motto. Its name is Legion. Impostors swarm through the country in the shape of vendors of corn-salves, tooth-ache drops, essences containing the virtues of all medicines extant, and pills much to be extolled for their virtues and their—cheapness, the latter indeed constituting a great reason why they should be purchased by all, on whom the itinerant calls:—they occupy the quiet recesses of pleasant little villages and mountain-sides, in the shape of cancer doctors and men exceedingly learned in the wonderful art of Urinoscopy;—as we enter larger towns and cities, symptoms of their presence are found in the shape of placards, show-bills, and recommendations on fences, piles of brick, lime houses and public buildings, inviting the public to try somebody's never-failing Liniment or Blood-purifier, or to call upon Dr. Mendacium "who *cures* all diseases of the ear and eye without any charge whatever," and still stronger symptoms yet appear in large flaunting signs, hung on the outer walls of buildings that are decorated with all that art or extravagance can furnish within, and devoted to the sale of the impostor's commodities. They boast themselves the untiring friend of the poor man, to whom they offer their remedies free of charge.—knowing that such seeming philanthropy is a good investment towards attracting substantial aid from the rich;—they invite sufferers from vicious practices to come to them and be healed;—and while they extract wealth from the pockets of their unwary patients, they flood the advertising columns of the daily prints with advertisements that make the virtuous youth tremble at their filth, the delicate cheek of the maiden to be crimsoned with blushes if her chaste eye should by accident fall upon them, and the father to keep the daily papers from the perusal of his children. In this latter form, Quackery has assumed so bold a front, that its advertisements have become fountains of pollution. Where ignorance is surely bliss, knowledge of the vilest diseases of our race is thrust before the pure, good and virtuous of our land. Such are the effects of the spread of Quackery in our time. Be its pretensions what they may,—be the real virtues of its nostrums never so useful in disease,—the basis on which the dealer constructs his plans is the desire to palm off something on the community that will put money in his pocket.

Let us now glance briefly at the success of Quackery and the causes that produce it. This success does not consist in the attainment of that good name which dieth not, but in the acquirement of piles of gold that may gild the impositions and fraud by which it has been obtained, purchase a false position in society for the Quack, and, after his death, build up a monument to his memory in which the beauties of Sculpture and Architecture shall be employed to mark, with ostentation, the place of his interment. But there is a just punishment of evil deeds, awarded by mankind to the unworthy, either during their life or after death. If contemporaneous history be not impartial, posthumous history is. The good may suffer contumely and reproach during life, but the purity of their intentions, the justness of their lives will be vindicated at some time or other, and posthumous praise will be theirs. The bad also, although plenty and success may seem to smile upon them, will have, after death, if not before it, their real unworthiness displayed by the stripping off of the gilded mask which concealed it. The former will live in the memory of their race, will have their names prized as precious jewels, and their deeds will become familiar as household words. The latter will live only in the shame that is their due, and memory will refer to them and their success as examples to be avoided by others; their piles of wealth will dwindle away, as ill-gotten gains ever must, without being of substantial benefit to their heirs. These results are beautifully displayed in the lives and deaths of the beloved physician and his antipode—the brawling impostor. The former is recollected, by his patients and their children, only with love, and little ones will be taught to prattle his name as that of a great and good man;

while the Quack is soon forgotten,—his splendid success living in memory as the gaudy scenes of a panorama which are, after all, the poorest imitations of something greater and more glorious that is real. Where is a fame more desirable than that of a Jenner, a Rush, and a host of worthies of our profession? Propriety forbids the mention of others, with a world-wide notoriety as Quacks during life, who have gone down to their graves,—their magnificent fortunes squandered by extravagant heirs,—their nostrums only found on the shelves of some old fashioned apothecary and their places filled, in the estimation of the credulous public, by some newer preparation with a more high-sounding and attractive title. Such is the success of the impostor? Which, gentlemen, would you have attached to your names? Will it not be your highest aim,—your proudest aspiration to merit the good will of your brethren by your good deeds, than to gain gold by means that will only call forth contempt? "A good name is rather to be chosen than great riches."

Of the causes of the success of Quackery it may probably be laid down as one of the most prominent, the disposition mankind has to repose confidence in those who loudly assert their ability to *cure* disease. This disposition rests on the principle of Faith, which never requires proof for the support of any assertion from those in whom confidence is placed. And this confidence is readily reposed in any man who exhibits much show of knowledge conjoined with a confidence in the value and importance of that knowledge. The relation of mind and body is so intimate, that where the former is fully satisfied, the recuperative energies of the latter are much better fitted to achieve the overthrow of any disease present for which they may be adequate. This occurs without referrence to the medical agents employed in the case. The honest physician too often overlooks the means by which this faith in his own powers can be obtained,—relies on his knowledge and, like every wise man, is perfectly conscious where that is defective and will not hesitate to say so. In this way, he depends upon his character, as a man, to sustain him as a physician. The Quack, however, has no care for his character as a man, but, boasting loudly of the efficacy of his remedies and asserting that *they* never fail, obtains just the very faith, for the want of which the physician fails to succeed. This confident manner attracts to the Quacks many of the gentler sex, naturally trustful of those who seem bold and self-reliant, who, with all the tender gratefulness of their nature, endeavor to repay for the supposed benefits they have received, by inducing their friends to come to the same fountain of relief. They throng the sick room and, constituting themselves, with the kindest intentions, special consulting physicians in the case, recommend the various nostrums of the day with an enthusiasm worthy of a much better cause.

Woman's aid constitutes thus the second cause of the success of Quackery, and it is indirectly a result of the first. A host of female would-be missionaries is raised up to bring the healing merits of Quack compounds before the community. If family medicine-chests are fairly entitled to the name of family-enemies, at least they contain nothing the composition of which is not known to those who use it, but what must be said of nostrums, whose composition and true properties are unknown to those using and prescribing them. Yet it is with the zest of almost fanatical zeal, that some of the gentler sex will urge the use of such articles on their friends and acquaintances. They introduce them into their own family-circles and soon bring husband and children into the ranks of the promoters of Quackdom, with very little astonishment either on our part, as woman is intimately associated with much that can cheer the sick room, ease the fevered brow and quiet the restless pulse of care.

A third cause arises from the apparent beneficial results which follow the use of Quack remedies. These may be pointed at by the Quack himself as overwhelming proofs of the value of his preparations. Let us examine into this apparent benefit from their use. We do not pretend to say that cures are not occasionally effected by the employment of such preparations; they often contain efficacious substances, and it must sometimes happen that these are suited to the diseases of those using them. We commenced our discussion of the subject by the assertion that truth was generally, in some way, involved in the composition of all quack medicines. In their indiscriminate application to disease, they may occasionally meet with that for which they are specially fitted, just as in the Lottery, some one will draw a prize, although thousands may groan over blanks. Yet the one prize seems to beget more partizan friends than the thousand blanks will produce of enemies.

It is mostly in Chronic cases where this class of nostrums are employed. In many of these, the system has been freed from disease by a previous course of medicine, and the recuperative energies of the patient are just coming into action, when the quack specific is brought into use, and then—of course, unless this is really detrimental to the animal economy, convalescence goes on and the patient gets well. All honor and credit is attached to the patent medicine, while the physician, who has carefully aided in the removal of such obstacles as were in the way of the *vis medicatrix naturæ*, is denounced as ignorant of his profession and entirely lacking in skill. With such cases continually before us,—not few in number and widely separated, but many and frequent,—we are able to appreciate the meaning of the terse proverb, now three centuries old;—"Happy is the physician, whose coming is desired at the declension of a disease."

Another mode of getting the credit of curing disease is that adopted by the disciples of Homeoquackery. This affects special ability to treat chronic diseases. These are often of such a character that the recovery of the patient is much delayed on account of imprudence in diet and regimen. The Physician neglects to impress, on his patient's mind, the necessity of an attention to these matters, and the patient trusts that the medicines employed will bring the desired relief under any circumstances; the Homeoquack lays greatest stress on these particulars, and declaims *learnedly* as to the injuries which will inevitably result if imprudences in diet or regimen are permitted, speaks of the great care which should be taken in consequence of the wonderful potency of his pillules, and administers, with all the solemnity that fanaticism or imposture can command, those little embodiments of the millionth or decillionth part of a grain or drop. The patient gets well,—all he wanted was proper attention to diet and regimen. It was strictly paid and *globules* get all the credit.

Again, the statistics of Homeoquackery show how numerous are the assumed acute forms of disease treated by it and the astonishing amount of cures. The first are not substantiated by the condition of the health of the community in which they are asserted to have occurred, and hence the second necessarily falls to the ground. A family, with an armament of globules at command, is always getting sick, merely for the purpose of getting well again,—adding, with recovery from each imaginary disease, additional strength to their credence in the system. It is so easy to set up a man of straw, and belabor him with blows or pierce him in a thousand places with the sharpest of daggers. The valor or skill required in such a combat is like that which Falstaff exhibited, according to his own account, in the attack upon the men in buckram.

A fourth cause, and probably one of the most powerful, contributing to the success of Quackery is the opposition, decided, full and firm, which it meets from our profession. It is difficult to restrain our feelings of indignation, when we see an Impostor palming off the grossest absurdities on a credulous people. But the expression of that indignation, accompanied by any violent means to put down such imposition, always gives the Impostor an advantage, since he can raise the cry of "Persecution," which is calculated to waken a tender cord of sympathy in the human breast. Men are found on all sides who will aid him, as a persecuted man, against the medical profession, and the latter is charged with being actuated alone by "desire for self-aggrandizement." From a feeling of tenderness for the supposed oppressed and persecuted, there arises a species of confidence in his nostrums, and hosts of zealous friends proclaim their virtues in all directions. This is not an imaginary case. The success of many a Quack compound has rested solely on the opposition it received from the Profession,—an opposition springing from a full belief in the necessity of unmasking imposition wherever found, but which alas! only eventuated in the sympathies of the public being aroused so as to furnish the strongest support to the very imposition it was thought proper should be put down.

These constitute the most prominent causes of the success of Quackery. It has invaded all countries,—infested all classes of society from the lowest to the highest, and attracted admirers and worshippers from the professional as well as the unprofessional. It succeeds best where the greatest opposition meets it. Like the vile Canada thistle, cutting down one hardy old stalk only restricts the vigor of the plant for a short time to the root, so that it bursts forth again in a number of young stalks, which will be more pernicious to the soil than their parent. It is not by pruning off privilege after privilege, or by using the scythe of the law, that we can remove such vile weeds from society. They will flourish all the better for the pruning, and even when trampled under the feet they will still put forth luxuriant growth. It is ever thus with noxious weeds,—connected with their constitution is a kind of pertinacious hold on vitality, most difficult to destroy. The same amount of rude treatment would destroy a delicate plant, prized for its beauty and fragrance. There is but one method of removing vile weeds from any soil, and that is to dig carefully about their roots until the connection of these is broken off from the soil, and then to consume them by fire. It is only by eradication that they can be destroyed.

How shall Quackery be eradicated from its present position? Shall it be by the use of the strong hand of the Law? This would only cut off one head of the hundred-headed monster, and, from the trunk, another would speedily grow. No! it must be treated as the weed,—its connections with the feelings of the people must be severed and *then* it can be hurled into the stream of oblivion, and all recollection of it will speedily be lost. This can be best effected by instructing the people in the mysteries of the human frame. Such instruction should be commenced in the school, so that the child may learn at an early age the wonders of the house he lives in. When knowledge is acquired of such subjects, the attainments of those who have spent their lives in these studies will be appreciated and the nature of the Quack understood. It is by disseminating knowledge of this kind throughout the land, by showing our fellow-citizens that pecuniary emolument cannot be the only motive that prompts the true Physician to the practice of his profession, and that the all-powerful incentive with him is love of his science, that we can hope to drive Quackery from its present post. Disseminate information on Anatomy and Physiology among the people, and the days of Quackery *in* and *out* of the Profession will be numbered. Briareus will then be overpowered, and, notwithstanding his hundred hands and fifty heads,—he will be covered up by the Ætna of public indignation.

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THE

Human Body and Disease,

CONSIDERED FROM THE

CHRISTIAN STANDPOINT,

BY

LEWIS H. STEINER, A. M., M. D.

FROM THE "MERCERSBURG REVIEW."

CHAMBERSBURG, PA:
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1858.

THE HUMAN BODY AND DISEASE, CONSIDERED FROM THE CHRISTIAN STAND-POINT.*

The Hebrew sage, after having mastered all the knowledge of his time, and learned that there was nothing new under the sun, commenced his sententious proverbs with the grand declaration, that "the fear of the Lord is the beginning of knowledge." How great the contrast between this devout declaration of a pious heart, and the godless assertions of those, who cultivate the paths of science without an humble recognition of their own nothingness as compared with the almighty Lord and Creator of heaven and earth! How barren and meaningless all the charms, which the mere worldling extracts from the fair fields of science, illumined by cold and cheerless light, as compared with those which meet the gaze of the Christian philosopher, whose vision has been cleared and brightened by his appropriation of the high and ennobling doctrines of his faith! The same objects—but how different the effects produced on the minds and souls of the two observers! One views them as the productions of an inconceivable Omnipotence, preserved by the agency of laws, which an incomprehensible Omnipresence is ever directing and upholding, and which are the wondrous manifestations of a mighty Omniscience. He is a stranger in a strange land. However much science may aid him to understand the phenomenal scenes which bewilder with their beauty and charm his senses—however much he may endeavor to exhibit, in words, the living attractions which all these possess, and with the aid of "the articulate voice of poetry," so well styled "the nearest approach of the human faculties to raptures more than human," his efforts only show too plainly, that he has failed to catch the significance of nature—he has failed to recognize the life which gives it all its meaning, and has contented himself with stringing dead bones artistically together; satisfied with a contemplation of the anatomy of nature, has overlooked the active current of vitality, which a knowledge of its physiology would teach him is wisely permeating every portion of creation.

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* *What Christianity teaches respecting the Body.* A sermon preached in the Parish Church, Crathie, 11th October, 1857. By Robert Lee, D. D. Regius Professor of Biblical Criticism and Biblical Antiquities in the University of Edinburgh. Edinburgh: Cowan & Co., 1857. pp. 31.

God in Disease, or the Manifestations of Design in Morbid Phenomena. By James F. Duncan, M. D., Physician to Sir P. Dunn's Hospital, Dublin. Philadelphia: Lindsay and Blakiston, 1852. pp. 232.

The other, although not possessed of a tithe of the scientific knowledge which the mere savan claims, yet feels that all nature, whether it be inanimate or animate, the insensate clod and the bright flower, the rugged mountain and the goat browsing on the crags, the dark storm-cloud, with lurid flashes of lightning, and the drapery of Tyrian purple, of gold and splendent silver which bedeck the western horizon as the sun slowly sinks from our gaze, the worm that crawls and the being of beauty, whose flashing eye, sweet smiles and gentle manners collect tributes from scores of devoted admirers—all these are but the works of a Father's hand. Filial affection for that Father in heaven, invests all His works with an interest that makes them dear to His child, who now feels that *these* are his birthright, that the earth on which he lives, with its phenomena, its secret and open wonders, was made for him, and that the same Almighty power that brought it into being, is exercising over it, through every second of its existence, a watchful care and supervision. For such an one, no cloud obscures his vision. The whole heavens are irradiant with light, that penetrates caverns, otherwise dark, illumines deep vallies, and bedecks with rainbow tints the rugged sides of the mountain. He has learned, that "wisdom is the principal thing," and that he is truly wise who fears God and keeps his commandments.

This contrast has been marked from the earliest beginnings of mere human science! Satisfied with a study of "*the things that are seen*," those which are unseen and eternal in their very nature, were neglected, or rushing to the other extreme, with a kindred blindness, and despising the material things of this world, a special devotion to matters pertaining to the soul and eternity was affected. In this way, two schools of philosophers, and two schools of religionists arose, and have perpetuated themselves even down to our time, despite the instructions which the revealed Word and the Church have imparted to mankind. The connecting link between the two is beyond the reach of the mere man of the world, and he will be found either deifying the material creation and worshipping its laws, or forming to himself some ideal which will claim his constant devotion. The vibration is between the two extremes, either materialism or spiritualism—the former doing violence to the spirit, and the latter, to the matter which it vivifies and quickens into life.

In the religion of the ancients, both extremes may be found. One sect would worship material substances; the other, believing God to be an eternal essence, rejected all material representations, and hoped by means of a blind faith to be brought into the presence of Him whom no man had ever seen. One rejected the spirit; the other rejected the only mode through which we could see clearly the power and efficacy of that spirit, and recognize it by our earthly senses. Need we say that the first was *wrong, radically wrong.* Such an assertion will meet an approval from every one in this Christian nation ; but we must go farther, and learn to know that the second was also wrong, and in many points fully as erroneous as the first. To the mortal being is denied any but a vague conception of the spiritual, unless he can rise to it from something material which it has once enlivened, and thus the material becomes as it were the first stepping stone to a knowledge of the spiritual. When the latter, however, is once gained, then it brings all aid to the more perfect understanding of the former, and the two are thus found essential to each other. We rise in the consideration of nature's phenomena to such inductions as set forth its laws, and these, if correct, make those more intelligible and clear to the human mind. They are classified and arranged, made to assume some real relation to the general ideas which they embody in a sensuous form, and mere human knowledge in this way becomes human wisdom.

It is true, that when we endeavor to form an idea of the existence of God, confining ourselves strictly to the region of Natural Theology, we find that all our deductions from effect to cause never lead to such an idea. But still, all over the face of our globe, wherever man lives and thinks, there is a recognition of the necessity of such an existence, of the existence of an Eternal Creator of all things, by whose fiat the heavens and the earth were made. And this idea comes not to us by reason, but exists in our minds, deeply and immovably fixed, as a part of their own original structure. It is one of those innate ideas which education can no more give than it can totally eradicate. As Brahma, Jupiter, Zeus, Gitche-Manito, or Jehovah, it is in every breast. The soul falls down and worships, from the very necessity of its existence, something higher, holier and greater than itself. This worship may blindly endeavor to exhibit to the senses, a representation of the form its imagination or fancy has declared the Supreme Being should possess, and, when left to itself, the representation will remain mean, low and material—yet the recognition of the spiritual is necessary. But with the pagan, all this is blind. He feels that his material representations are, after all that he may do to embellish them, but inanimate or soulless structures, which are infinitely inferior in perfection to his own human body. Driven almost to despair, he pictures ever to his mind God as a great Creator and a great Destroyer—One in whose presence he can never come with an assurance that He will graciously listen to his complaints, or extend a father's kindly hand. Feeling that the highest object on earth he can respect is his fellow-man, he invests his God with a human form, and by exalting the faculties of the human being to a species of perfection, falls down and worships heroes and demi-gods. This is the highest form that worship can assume with the non-Christian soul.

With the Christian, however, this idea assumes a clearness that makes it satisfy the wants of the soul, and yet is divested of that which is terrifying or appalling. He learns to know the Almighty Maker, of whom an innate idea exists in his mind, through His Son, who assumed a *human* form, took upon Himself the nature of man, and then, as *the perfect man*, sympathizing with all human griefs and woes, feeling the tender ties which bind the son to the mother's heart, enduring contumely and scorn—living, breathing, suffering and enduring as all men must do, finally, after a most unjust persecution and series of cruel sufferings, met an ignominious death upon the cross. This simple tale told of a man opens up the sympathies of the human soul. It feels that, while all this has occurred with a man, yet there must have been conjoined with *His* human nature something greater than human nature, under any other circumstances, could have exhibited. Now the God-like shows itself. At length man can learn to know his God. And when faith seizes hold of the idea of the incarnation, sympathies are converted into adoration, love and worship become so intermingled that they are inseparable. God is recognized as *our* Father, because His well-beloved Son had assumed in the course of time the form and attributes of a brother, and we hail him as our elder brother for all eternity. Then, by the aid of faith and the light which the Holy Spirit brings to us, we learn to appreciate still more that material form, that personality which first attracted our attention, and whose charms wooed us to a knowledge of the holy and the divine. Thus the Christian can sing with one of his own poets—

"Till God in *human flesh* I see,
My thoughts no comfort find;
The holy, just and sacred Three,
Are terrors to my mind."

If, then, the humanity of Christ proves attractive to the wandering soul, and from this it rises to higher and fuller conceptions of the nature of the Trinity, it must needs be that the human form, which was thus sanctified by being made the dwelling place of God, is entitled to our respect —that no true Christian can treat his body as an encumbrance to his soul, which it were well to be rid of, without doing injury to one portion of his human nature. It follows, that that which Christ thought it not unworthy Him to assume, should not be a hindrance to the Christian's soul on earth, but should be made to co-operate in the great end and aim of life, viz: the glorifying of God.

We propose directing attention to the teachings of Christianity as to the human body and its diseases. The subject is one which an enlightened Christian mind will find is not sufficiently understood, and that some of our Churches have so far failed to appreciate it, that a disrespect of the wants of the body has been considered tantamount to a high exaltation of spiritual life, while others have looked upon every disease as an indication of a direct visitation of God for some violation of His holy law. We trust that both these views will be seen to be erroneous before the subject is dismissed.

That the soul is clogged, in its aspirations after a holier state of being, by the wants of the body, seems to be an error woven into the very substance of the religion of the day. From the pulpit we are taught that the body must be despised, that the day of death will be a day of joy simply because we shall be freed from pain and sickness in losing our bodies, and that the Christian becomes more and more fitted for heaven, in proportion as he spurns those nice attentions to his body, which physiology teaches him are requisite to keep it in perfect condition. Still further, the religious devotee, relying upon works, and not upon faith, which shows itself *through* works, bewilders himself into the notion that the more privations undergone on earth, the more pain and suffering experienced, the more sure his passage from a world of trouble to one of bliss. As the Hindoo devotee, he assumes that by forcing his body into unnatural positions and retaining it in such for months and years, by lacerating his body with knives and burning it with fire, by undertaking long and painful pilgrimages to the shrine of Juggernaut, he will purify his soul from the pollution of this world, and fit it for a blissful hereafter. Should death befall him on his toilsome pilgrimage (and millions have thus perished), it is hailed as a happy boon. Or if, perchance, the Car of Juggernaut roll its huge weight along, joyously he throws himself under its wheels, and, by a horrid end, hopes to gain celestial glory. As the widow, the funeral pyre of the dead husband is mounted, and, amid the blaze of the burning wood, life is lost with the hope of endless joy to the spirit. Again, as the crusader, under the maddening watch-cry of "God and my Lady," unknown lands are crossed, perils encountered which appal our minds even at their very recital, and death is hailed with joy as the brave man's sure admission into the courts of heaven. Infatuated with the same blind zeal, the ascetic undergoes days and nights of continuous fasting, exposes his body to stripes, deprives it of the comforts which sound health requires, and thus endeavors to purify his soul from contamination with the world.

We do not desire to overlook the real bravery which underlies all these self-inflicted tortures, nor would we in any way contribute to a cowardly fear of bodily suffering that would prevent men from encountering any peril that the cause of religion or humanity should throw in their way. Rather would we employ the words of Kingsley,* and sound them aloud even in trumpet tones, that "he who willingly throws away his life for the cause of mankind, which is the cause of God, the Father of mankind, shall save it, and be rewarded a hundred-fold. He who renders up his animal life as a worthless thing, in the cause of duty, commits his real and human life, his very soul and self, into the hands of a just and merciful Father, who has promised to leave no good deed unrewarded." It is not a question whether a man should encounter peril, when duty calls him to the task. The question is, should he seek to mortify his body, when no such call is made, with the vain hope of thereby doing good to his soul.

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* Lectures on Alexandria.

1. The human body must be respected by us, because it was selected, of all created forms, as the particular one which the divine nature entered into and assumed. Christ Jesus, the Son of the living God, "begotten of the Father before all worlds, God of God, Light of Light, very God of very God—of one substance with the Father, by whom all things were made, for us men and for our salvation came down from heaven, and was incarnate by the Holy Ghost of the Virgin Mary, and was made *man.*" Or, as we find the same idea expressed in the glorious old Te-Deum: Tu ad liberandum suscepturus hominem, non horruisti Virginis uterum. And what is included in the idea of man? Dare we think of it as a mere spirit unclothed with material form? Can we picture to ourselves the loved ones who are no longer with us on earth, in our waking visions or nightly dreams, in any other way but as occupying *human* bodies? Does the mother, whose babe has been removed from the troubles of a sinful world, and carried by the loving arms of angels to that home where her hopes and faith induce her to believe she will again meet her never more to be separated—does she invest her with any other but the loved form? Does the husband picture to himself, as he notes the passage of the weary hours, brooding in melancholy sadness over the object of his heart's inmost affection, lost now to him for this life—in any other but that quiet, matronly form and loving face which had become a part of himself? No! No!! We all firmly hope—for we have all had our heart-strings vibrating in unison with sadness at the removal from our sides of some quiet, gentle spirit, or some great, loving soul—to meet those, who have left us on earth, where partings shall be no more, and where mutual recognitions shall be granted us.

"The Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul." Soul and body are necessary to the idea of humanity, and the fallen condition equally affects both. While the one, left to a state of nature, is directing her way towards the gates of perdition, the sentence passed on the other was, "Cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life." The object of the incarnation was to sanctify both soul and body; hence we say that Christ assumed the human body when he became man. In this view, our bodies command higher respect than when viewed as mere organisms, involving both mechanical and vital operations. A species of awe fills one's soul as he thinks that the same form, which he wears, was once worn by the Deity himself, and that thus we have become, potentially, of the same family, and, if we only will, that our elder brother will prepare for us a mansion at his Father's.

The intimate relation of Christ to his Church is frequently likened to that of the soul with the body—"for we are members of His body, of His flesh, and of His bones." And St. Paul distinctly sets forth his belief in the sanctification of this body when, writing to the Thessalonians, he prays that "the very God of peace sanctify you wholly; and I pray God your whole spirit, and soul and *body*, be preserved blameless unto the coming of our Lord Jesus Christ."—1 Thess., v. 23.

2. We are specially enjoined, "by the mercies of God, to present our bodies a living sacrifice, holy, acceptable unto God, which is our reasonable service." This passage, together with another from the Epistle to the Corinthians —"glorify God in your body," has doubtless been warped from its true meaning by those who believe in the value and efficacy of self-inflicted tortures. "The glorifying of God" and "the living sacrifice" are not accomplished by such means, but by a consecration of our bodies to the good, and an avoidance of those sins which the allurements of the world, the flesh and the devil would lead us to commit. The sacrifice is not to be a dead, but a living sacrifice, which can alone be acceptable unto God. Hence, if we maim our bodies, injure any of our limbs, or in any way do them harm, we prevent to that extent the presentation of this sacrifice. The student who, from mistaken notions of zeal in his calling, deprives nature of her *proper* amount

of rest, the cloistered devotee who brings on disease and suffering by a neglect of the ordinary rules of health—the minister who permits *animal excitement* so far to influence him in his calling as to transcend the rules of health ; these are all not presenting their bodies as living sacrifices, but are acting criminally in inducing disease by setting at defiance known laws, and thus unfitting themselves for carrying out the duties which Providence has assigned them.

3. The body is called "the temple of the Holy Ghost which is in you, which ye have of God, and ye are not your own. For ye are bought with a price ; therefore glorify God in your body and in your spirit, which are God's." In one point of view, this passage of Holy Writ is calculated to produce great awe to the Christian's mind, for it is especially directed to him. That the Third Person of the Trinity, proceeding from the Father and the Son, should deign to employ our frail and sinful bodies as a place in which He should dwell, is so wonderful an act of condescension, and yet involves such terrible responsibility, that one may well tremble lest he fail to keep that temple pure and free from contamination with the gross lusts of the flesh. But then the comforting thought comes to the mind, that He is "the Lord, the Giver of life," and it is through His agency we are enabled so to conduct ourselves, as members of Christ's mystical body, that His Father shall be our Father, and that He is the comforter that Christ sent from heaven for the suffering and weak members of His Church on earth. It is said that the father of Origen, kissed reverently his infant son when sleeping, as though he felt the necessity of paying homage to the human personality which was enclosed in his little form. But when we think of the indwelling of the God-head in the baptized child, that it has been accepted by Christ, through His minister, as a member of His own body, dare we look upon it, however humble its position may be in life, as any thing but one of the noblest and grandest things on the earth ? Laws of human origin give man the right of resenting any bodily injury, even to the taking of life of the offending party.

We can see how these are based upon right, as the nature of such an injury involves an insult offered to a temple of the most High—a consecrated place, wherein God Himself delights to dwell. Not wishing to justify the rash use of such a law, yet it is clear to our minds, that one of the grossest insults that man can offer to his fellow-man, is that which involves ignominious treatment of his body. That returning evil for evil is not laid down in the code of morals which flows from the relation of the Christian to the Saviour, is manifest from Christ's own words, that good should be returned for evil, and that when smitten on one cheek the other should rather be turned to the smiter than retaliation should be employed, and also, from His own example, during the whole train of events which filled the days of His trial, sufferings and death.

If the body be the temple of the Holy Ghost, does not this fact tend to ameliorate the condition of the poor, the enslaved and the oppresed? The relations which existed at the time of Christ were not destroyed in order to allow the reception of the new Dispensation. A life was given to the world which was intended to penetrate all classes and conditions of society. No laws or commands were laid down declaring one form or other of government the correct one, but the disciples were taught to reverence Cæsar, to respect the powers that be, with the certain result that all forms of oppression would *lose* their oppressive character under the genial influence of Christianity, and would exist then but as forms. It is well to keep this in mind, when a willful and rebellious spirit urges us on to an overthrowal of authority. It is better to bear "hoping all things," than to act on the impulses of our own proud wills and cast off proper allegiance. He that hath Christ in him, and recognizes the bodies of his brethren as being the temples of the Holy Ghost, will treat them with Christian kindness, whether they be known as subjects, slaves or brethren; and he that hath not this life in him, will maltreat even his equals in the world's scale of rank. The former has the highest authority and influence to induce him to be kind and considerate, the latter has nothing but his reputation in the world to regulate his conduct. It is easy to see which one can be trusted—on which we can rely in the time of necessity.

4. The next consideration that we shall adduce as demanding from us respect for the human body, is the fact that there will be a *Resurrection of the Body.* The doctrine of the resurrection, as set forth by Paul, is based upon the fact of the resurrection of the Saviour, and it is explicitly stated, that "if there be no resurrection of the dead, then is Christ not risen." Upon the fact that the God-man had overcome the power of death, and had set aside the punishment which sin had attached to the human race, the doctrine can rest securely. The soul and body shall be reunited—the latter no longer a fleshly body, but a spiritual body, freed from all the imperfections inherent to animal life here, and invested with glorious attributes. Here is not the place to dwell upon the proof that such a resurrection of the body must take place. We receive it, as all the other articles of the Apostles' Creed, on faith—an object, not of argumentation, but of belief—a truth which flows necessarily from one's belief in the Humanity of Christ, and is inseparably connected with the same.

In *these* bodies shall we be assembled together at the resurrection-morn. The thought is overpowering! We eat and drink, and in a thousand ways indulge in lawful and unlawful pleasures, sacrifice comfort and ease for the gratification of the "lust of the flesh, and the lust of the eyes and the pride of life," make our vital functions contend with countless difficulties which a decent respect to them should induce us to avoid, and thus make our animal life altogether abnormal and artificial, instead of normal and natural. All this is done in a body, which is not destined, in its true nature, to perish, but which shall be raised from the dead, and live throughout the countless ages of eternity. Let us be understood. We do not wish to convey the idea that the fleshly particles, which Chemistry informs us make up the structure of our organisms, should be raised up from the grave exactly as they were at the moment of death, invested with the law of decay and constant change. It would be degrading to the idea of the resurrection to suppose, that the albumen, fibrin, nervous and osseous structures, the blood and the changing secretions and excretions should necessarily exist in the body at the time of the occurrence of this grand phenomenon, as they now appear. But whatever now constitutes human identity, whatever causes us to remain the same amid the constantly recurring changes which perishable matter undergo, *this* will rise and form the spiritual body, which shall thenceforward live in happiness or perdition. What it may be, is a mystery, and cannot be fathomed by human knowledge.

The separation of the vital spark from the body, leaving it for the moment with its natural expression—that by which we knew it best, is not eternal. No! We know that all is not lost, although we may sympathise with the wondrous truths embodied in those beautiful lines of the poet:

"He who hath bent him o'er the dead,
Ere the first day of death has fled,
The first dark day of nothingness,
The last of danger and distress,
(Before decay's effacing fingers
Have swept the lines where beauty lingers),
And mark'd the mild angelic air,
The rapture of repose that's there,
The fix'd yet tender traits that streak
The languor of the placid cheek,
And—but for that sad, shrouded eye,
That fires not, wins not, weeps not, now,
And but for that chill, changeless brow,
Where cold obstruction's apathy
Appals the gazing mourner's heart,
As if to him it could impart
The doom he dreads yet dwells upon;
Yes, but for these, and these alone,
Some moments—aye, one treacherous hour,
He still might doubt the tyrant's power;
So fair, so calm, so softly sealed,
The first, last look by death revealed."

Paul expresses the idea of the resurrection and the Christian's hope hereafter, when he says, that "we that are in this tabernacle do groan, being burdened; not for that we would be unclothed, but clothed upon, that mortality might be swallowed up of life." With such a grand birthright, the human body demands our respect. We dare not treat it as the beast that perisheth. There is an eternal future for it. The microcosom that is before us is destined to survive all the changes which seem now so wholly to control it. Gaze at it in whatever form we please—as innocent childhood, with its lively prattle about joys and pleasures that we consider trifling and of no importance; as man, exulting in his strength and fearlessly compelling nature's agency to the performance of his own behests; as meek, lovely woman, going about and doing good, bringing peace and content to the troubled soul, comfort and relief to the suffering body; as weak, tottering age, "the poor, infirm, weak and despised old man," dependent, even as in childhood's days, upon the ministrations of others, hoping for the hour when his release from sufferings shall be announced; in health or in sickness; doing good to his fellow-men or violating laws both human and divine, the human body must be treated with respect, punished or rewarded in accordance with just laws; for its existence is not for the moment, but for the ages which in a ceaseless succession shall follow each other, with an unerring course and precision, throughout an immeasurable and inconceivable eternity.

All that we have heretofore said involves necessarily the duty of guarding with great care the health of the body. Indeed, in one point of view, this is as necessary as the health of the soul. The two are singularly connected together. The happy contented soul acts upon the material frame which it inhabits, and stamps its mark on the countenance, while the filthy and degraded body reacts upon the soul, and imparts to it a low and grovelling tendency. Even a superficial glance at this relation of soul to body, will justify us in asserting as another argument obtained from the Christian stand-point:

5. That *physical* health is more or less necessary to the

perfect health of the soul of man, and that his spiritual faculties thrive *best* when his body is not exposed to pinching penury and want. Says Dr. Lee, to whose sermon on this subject we acknowledge ourselves largely indebted, "certain states of the body undeniably occasion, irritate and inflame those appetites and inclinations, which it is one great end of Christianity to repress or regulate. It is known how much our blessed Saviour insists upon meekness, long-suffering, gentleness, patience and the like. * * * But these graces, which are so difficult in even the best condition of our corrupt nature, are rendered almost impossible by certain states of the nervous system. Sad experience has caused some to know, how dire a struggle the spirit is sometimes called to maintain against the flesh; and that it is easier for a camel to go through the eye of a needle, than for a dyspeptic person to be gentle, meek, patient, long-suffering."

The laws of hygeine, when neglected, revenge themselves not only on the body, but on the mind and soul. Much of the brooding melancholy, the fashionable disease, "Vapors" or "Blues," the sickly lackadaisical sentimentality of very young and very silly lads and lassies, the petulant and irritable tempers of men and women—much of all this is the direct consequence of an open violation of the laws of health. The body has revenged itself on the mind and the soul. If these will not respect the laws of its being, it will overthrow their equilibrium, and leave them to torments akin to those it is suffering. And the effect pervades every act they are called upon to perform, whether religious or secular. The clergyman who relies upon extempore inspiration in the delivery of his sermon, or who eschews liturgical forms for public worship, and prides himself upon the offering up of impressive prayers, instead of acting as the mouth-piece for his people in their confessions, thanksgivings, petitions and intercessions, should, above all others, feel himself bound to pay the most rigid attention to the laws of health, lest a morbid condition of body should react on his mind, and his people be made to suffer, with fatigue and weariness of spirit, on account of his bodily infirmities. Many a sermon, breathing the threatenings of the law instead of the gentle pleadings of the gospel, has been occasioned by a fit of indigestion, which soured the speaker at the whole world around him. Many a tirade of condemnation of his fellow-Christians has been the result of a surfeit at the table. The law of charity has been violated over and over again by those, whose Christian character would have never justified such a violation, had their whole being not been shaken, by an open and senseless following of habits which have overthrown their bodily health.

There was a deal of good philosophy in the words which Shakspeare puts in Cæsar's mouth, when he wishes to have himself surrounded with

"Sleek-headed men, and such as sleep o' nights."

The loss of rest, in consequence of the excesses of the day, also acts powerfully on the spirits of man, and his religious experience is often shaded by dark, lowering clouds, produced from such causes. We have not the space, but the subject is worth examination, as to the fanatical sects and orders which have really originated from diseased bodies acting on the minds of their originators. It would be curious to investigate the condition of the digestive organs of those, who, with childish fretfulness, have thrown aside all Church authority, and have rushed, with an insane zeal, into the extravagances to which an unbridled private judgment has led them. How much that the world has been accustomed to consider as the result of sound conviction and unwavering assurance, would soon reveal itself as the silly whim of a morbid constitution?

Indeed, nothing can be more certain than, that many a Christian is heaping up for himself life-long pain and sorrow by his carelessness as to the wants of the body; and while dark, brooding clouds are hanging over his soul, preventing those outshinings of happiness and content which are so peculiarly his right, he is but reaping the inevitable results of a violation of nature's laws. The *sana mens in corpore sano* was the object of the prayer of the heathen writer, and it is a crying shame that the Christian should not know that this *sana mens* can never be fully attained under any other condition. The wild dreams of the ascetic, and his cruel self-torturings, together with the inhuman shouts and ear-piercing shrieks of the fanatic, are all indications of morbid mental faculties, too often occasioned by violations of the laws that the God of nature had ordained as essential to the normal state of their bodies.

A healthy condition of the body enables us the better to perform the duties which are incumbent on us, during our residence on earth. These fall naturally under the three heads of duty to God, to fellow-man and to self. A slight glance at the relation a healthy body bears towards the performance of these duties, is all that can be allowed us at present.

We have already shown how man's religious condition may be affected by a morbid condition of the body, and it is easy to perceive, that all this must seriously affect his relations to the Deity. The command to love the Lord, involves not only all the heart and soul, but also all "our might." What if we have made our might weakness by our own misconduct or carelessness, is not this a sin against the command? We must "glorify God in our body," and this is not and cannot be done, if we pursue a course of conduct which will deprive the body of any of its strength, or impair the vigor of any of the vital functions.

Our relations to our fellow-men are briefly set forth in the Saviour's second commandment: "Thou shalt love thy neighbor as thyself." Love—what is not embraced in that comprehensive word! The greatest of all the Christian graces, it blooms in the barren plains and all around becomes irradiant with its rainbow hues, and is redolent with the perfume of happiness and holy content! It dwells in the humble cot, and poverty is no longer a privation and hardship, but the bright beams of another world gild all that is rude and misshapen with the gold of heaven. It brings relief to the sorrowing and heart-sticken, whispers consolation in the mourner's ear, seeks the poor, the blind, the halt, and cheers them up amid life's devious paths, tends by the bedside of the dying, and smooths the pillow on which the head of the sufferer, in the anguish of death, is resting; braves the dangers of the battle-field to carry relief to the wounded soldier, delights in divesting plagues and fevers of their terrors, and smiles even when death presents his gloomiest terrors. It has its true resting-place alone in the Christian's heart—there it lives and flourishes, because the love of Christ only can woo it fully forth in man's nature. If it go forth and seek one spirit as its peculiar object, and the strong and active unites itself with the tender and gentle, the twain grow together as one, and through all time and eternity, remain united with the blessing of God resting upon them. But, that this love should thus flourish and bear fruit, it is necessary that the body, the instrument through which it acts, should be in perfect condition, able to endure all things in its gentle ministrations, and sufficient for the work which Providence furnishes it.

How happily was the idea of strength and virtue expressed by one word in the Latin! And love without strength of body, is love with its wings clipped. No longer either able to fly or even to walk, it is comparatively impotent as regards the performance of good to its fellow-men. We are not allowed to take our lives into our own hands unnecessarily, because they are God's, and we have our duties to our fellow-men continually pressing upon us. If we take not every care in the preservation of our health, we shall not be able to exhibit that indication of "pure religion and undefiled," which James says consists in visiting the fatherless and widows in their affliction.

But our duties to ourselves also require that we should cultivate high health. One of the first commands to fallen man was, that, in the sweat of his face, he should eat bread. To labor so long as we remain on earth is our duty—our pleasure, we might say; for labor gives zest to life. The truly miserable man, is he, who has no employment for his mental or bodily faculties, who sighs in the morning for the arrival of the evening, and at nightfall prays that the light may speedily return. With him, who labors either mentally or bodily, the day is *never* too long. Conscientiously endeavoring to perform his duties, he feels that he is obeying God's own command, and this lightens his toil.

We have no right to speak of trusting in Providence, while we reject the means he places at our disposal for the satisfaction of all our needs. It is, in fact, a species of irreverence which usage has permitted. Far more reverent was the command of Cromwell: "Put trust in God and keep your powder dry," than the folding of hands and pretended resignation to the events of the day, without an effort, fairly and honestly made, to force them to act for our own benefit. Dr. Lee, on this subject, well says: "Patience, which is perhaps the greatest, is also the last of the virtues, the sheet-anchor of the soul, not to be had recourse to till a a tempest has fallen upon us out of heaven, and we are in extremity. Let us never preach patience, when we can point out the means which shall render patience unnecessary. The patience which endures removable evils is not acceptable—it is an insult to the Almighty: it is not a grace of the spirit, but one of those lusts of the flesh 'which war against the soul,' and against the body also."

Notwithstanding all our attention to rules of hygeine and the most careful compliance with the requirements of science, yet disease invades the secret recesses of the organic system, bringing with it pain and suffering. "Although affliction cometh not forth of the dust, neither doth trouble spring out of the ground; yet man is born unto trouble, as the sparks fly upward." At the mere mention of the word disease, a shade of sadness passes over the human countenance; for from it have arisen "the thousand natural shocks that flesh is heir to." Visions of sleepless nights and days of torture come before us, when the spirit, aweary of the pains and troubles of mortality, is groaning for release and even disposed to complain that it is not set free from its companion, the body. How we are all able to realize, to the full extent, the meaning of the word, from personal experience, and from watching by the couch of those who have suffered and died! Enshrouded in gloom, invested with appalling terrors, a frightful object indeed is disease to the natural man! Does it not imply a loss of relish for the beauties of the fair world around us, a deprivation of that appreciation for the wonderful and sublime which we possess in full health? It is presented as the antipode of happiness, the synonyme for misery. We associate it with the idea of extreme misfortune, and look upon those who have devoted themselves with full zeal to its alleviation as men who prey upon the miseries of mankind. All are willing to admit that it is a grand and beautiful sight to witness a man in the full tide of health, each organ performing its function with regularity and precision, the life-current of blood running its appointed course gaily and vigorously through the system. Herein they are willing to recognize one of the evidences, which that mis-named science, Natural Theology, is ready to bring forth, of the wisdom, goodness and greatness of the Almighty Creator. In health, there are marks on all sides of design. A perfect structure, full of proofs of consummate skill stands before them. But in sickness, according to the general notion, evidences of defect appear in the organic functions of life, and few are willing to recognize the wonderful indications of design which disease sets before them. We will be but giving the complement of our subject by occupying some space with the subject of disease as viewed from the Christian stand-point.

Disease may seize our bodies, either from what is generally known as accident, as a penalty for violations of laws of health and for an immoral life, or from causes which are hidden from human ken. In whatever way sickness comes, it is by divine appointment. We arrive at this conclusion from the frequent mention in Holy Writ of the direct agency of God in causing disease and even death to attack the people of Israel; and the character of these instances, does not justify us in the belief that they were exceptional, but that they were the results of a regular law. So long as we permit the idea, that it is from Satanic influence, we shall not be able to endure, with resignation, the pangs and anguish which it brings. Duncan, in his excellent little essay on "*God in Disease*," says that, "from the case of Job, we are warranted in concluding that Satan can neither put forth his finger to touch a single individual, nor carry his malicious designs one step further than the divine persuasion is pleased to allow. Viewed in this light, the intervention of Satan, if it really exist, cannot properly be regarded as the cause of the occurrence of the disease, seeing that he is only an inferior instrument in carrying out the designs of Him who doeth according to His will in the armies of heaven, and among the inhabitants of the earth." *

There is a special reason why this notion of Satanic agency, in the production of disease, should be overthrown. Those who are acting under its suggestions, purposely avoid such aids as nature, through the science of medicine, may offer for the relief of pain and suffering. They hope, by prayer and reliance upon a miraculous interposition of divine power, to be freed from suffering, and refuse all material aid which nature may afford. A similar mistaken idea fills the minds of those, at times, who even believe that disease is the result of divine command, and they refuse to interfere with it, saying that God has sent it as a punishment for sin, and that it is arrogating to ourselves the right to interfere with His appointments, if we dare to adopt means for the removal of the cause of sickness. Such a position can only be explained by the existence of fanaticism, and can be justified in no way at all. It is really the highest order of irreverence to assume the ability to interpret that which God has, for reasons sufficient to Himself, kept concealed from us. And this we do, when we declare that all disease is intended for punishment. Such an explanation is not furnished us in the Holy Scriptures, nor is it a legitimate deduction from any of the articles of our holy faith. When we are deprived of such authorities for opinions on sacred subjects, all conjectures are merely gropings in an unfathomable darkness, where no glimmer of light can be had for the guidance of our steps.

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* God in Disease, 13.

Besides all this, we know that nature, with a free and liberal hand, offers us that which will alleviate disease, bring relief to the bed-ridden sufferer, and remove pain from the distressed. If disease be a patent fact, then also is this a patent fact, that the same God, who has established it, has furnished with a liberal hand, healing balsams and curative medicines in the three forms in which he has been pleased to create matter. If one be an evidence of His power, so also is the other. We are taught in "the Wisdom of the son of Sirach," that we should "honor a physician with the honor due unto him, for the uses which ye may have of him: for the Lord hath created him. For of the most High cometh healing, and he shall have honor of the king. The skill of the physician shall lift up his head: and in the sight of the great men he shall be in admiration. The Lord hath created medicines out of the earth; and he that is wise will not abhor them. * * Then give place to the physician, for the Lord hath created him: let him not go from thee, for thou hast need of him. There is a time, when in their hands there is good success." And we also read, that one of the chosen twelve was *Luke, the beloved physician.*

If we were placed in this world, with all its products as ministers to our wants in one form or other, then there is a solemn necessity for us to cultivate an acquaintance with nature, so that we may know the extent of our power, and use it with thankfulness to the Being from whom it has come. This necessity becomes more and more pressing as knowledge increases in the earth. A much less excuse would have justified a man for neglecting it years ago than now. If the fear of the Lord is the beginning of true knowledge, it is evidently not intended that we should avoid acquainting ourselves with those facts which will enable us all the more to appreciate His wonderful power.

When sickness and suffering result from what is generally called accident, we are most often totally unable to account for them. The world is accustomed to associate the word accident with the idea of chance or blind fate. But wherever fatality exists, there also exists denial of the existence of a Divine Providence. The Christian can believe that his God, "behind a frowning providence, hides a smiling face." With Job, he can say, "Though He slay me, yet I will trust in Him." When losses of property and substance are conjoined with the death of all that is near and dear, he can bless the Lord, and piously exclaim, "The Lord gave, and the Lord hath taken away."

But disease is often also the result of wicked conduct or willful violation of the laws of health. Here we are enabled to detect the relation of effect to cause, at times, with wonderful accuracy; and it is well it is so, since mere considerations as to the consequences of a wicked career, or of carelessness as to health, may sometimes produce a reformation. If we see a long continued career of intemperance terminating in an enfeebled body, a shattered nervous system, and a brutalization of the finer faculties of man, we do not hesitate to attribute these to it as the cause. Or when the terrors of an attack of *delirium tremens* present themselves—when horrible shapes and forms are tormenting the poor sufferer with terrors more awful than those which the earth in reality can afford—when helpless and hopeless, he seems as if undergoing the torments of the damned even while on earth, and friends fly his bedside as though escaping from a loathsome object, here we have no difficulty in pointing out the exact cause and origin of all this array of frightful symptoms. When the glutton complains of the effects of a confirmed dyspepsia, the student of oppressive palpitations of the heart, or an unsettling of the nervous system—when the slave of passion or lust shows his body all hideous and loathsome with ulcers and disease, we have no hesitation in pointing out certain violations of the laws of God, as the direct and immediate causes of these effects. Our judgment is not at fault under such circumstances. There are, however, other cases, where we can find no assignable cause for the origin of the disease, and it is irreverent to declare that there must have been some sin for which God has sent the disease. It is then not reasonable to conclude that disease is the punishment for sin. Are not the good often stretched upon beds of sickness—for days, weeks, months and years the subjects of anguish and pain? The little infant, before its reasoning faculties have fitted it for indulgence in sin and its fruits, endures pain, spends sleepless nights, seems destined to undergo, with inevitable certainty, a fixed course of diseases, which the physician finds often are beyond the power of his science. First comes the nervous and febrile sufferings consequent upon teething, then whooping cough and measles, chicken-pox and scarlet-fever, mumps and diseases incident upon hot weather and foul air. Surely these can not be sent as *punishments*, and, if we cannot see their necessity, it behooves us reverently to acknowledge our ignorance. A man's knowledge is none the less respected because he confesses that of which he is ignorant.

While, however, we dare not look upon all disease as sent for punishment, we may look upon it as intended sometimes for correction. The chastening influences of sickness have proven blessed, beyond the power of words to express, to many a man's soul; and the sick bed has become thus a dear place to memory, as by its influence and monitions the wanderer has been made to see his error, and has obtained that strength and courage and knowledge which enable him to retrace his steps, and begin his career of life, as it were, anew.

The Christian has learned to kiss the rod, however severe may be the blow which it has given him. In any view, we are safe to conclude that sickness is *for the glory of God.* While we are commanded to glorify God in our body, it is not stated that such an end can only be attained in health, but it may also be reached when the whole system is racked with disease. When the latter is not the result of any misconduct on our part, there is great room for doing good, even through the submissive spirit with which it is endured. Who has not felt, as he left the bed side of an humble, patient Christian soul, that its gentleness and endurance most beautifully illustrated the strength of the Christian's hopes, and the strength of that foundation on which all these hopes were placed. The gold that is tried in the fire, that is rubbed by the burnisher's hand, only comes forth the more brilliant for the treatment it has received. It is purified from the dross, and is more precious for the separation. The corrections of the divine hand are extended in mercy even to the erring and sinful, and are hardly to be considered as the evidences of an angry God.

In another point of view, disease is preservative. There is something foreign to the human system, latent in its inmost recesses, which would work its entire destruction, did not the preservative effects of disease remove the peccant substance from the system. Medicine furnishes us with a host of illustrations of this fact, and the main use of its armament of remedies is not so much to cure disease, as to aid nature in her efforts to throw off morbific matter. It is nature that cures diseases, medicines only aid her efforts, give power where she is almost powerless, strength where weakness prevails, and the gentle stimulus to functions that, when fully aroused, will drive the intruder from its lurking place. A strong proof of design is thus furnished from the history of disease. Duncan has illustrated this admirably:* "Let us for a moment suppose, that in exploring some remote and uninhabited quarter of the globe, we were unexpectedly to come upon the remains of some gorgeous temple, which displayed the marks of great beauty in its original formation, but which had been levelled with the ground shortly after its completion—not by the action of the elements on its mouldering materials, nor by the ruthless hand of violence, but by a person of equal skill, with its original architect, as evidenced by the care and attention bestowed in the position of the prostrate portions—

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* God in Disease, 21.

would not the attentive observer be irresistibly led to the conclusion, that some circumstance having occurred to render the continuance of the edifice in the locality originally selected inexpedient, the owner of the building, or perhaps the architect himself, enamoured of his work, and unwilling that it should be destroyed, had superintended the process of taking it down, with the intention of rearing it again in a new and more permanent position." Thus is it in disease. The same wonderful adaptation of means to ends pervades the human body in disease or in health. Although the vital actions may be broken up or suspended in some organs, yet those which take their place show the same wonderful evidences of design throughout their every portion. When inflammation attacks an organ, the blood vessels show themselves fully prepared to meet the emergency, and all morbid affections are but illustrations of the same result. The hand of God is seen in the history of disease full as well as when the glow of health mantles the cheek, and the blood courses gaily through its cunningly devised channels, visiting all parts of the body and bearing life to them all.

In another point of view, however, disease is often a blessing. It tries friendships, and shows when and where they may be trusted. The sunshine friends, those butterflies of formality and fashion, flee from the sick bed. Those who had fawned upon us, flattered our pride and taken advantage of our weakness, no longer are found by our sides. It is an awful thing for the weak and insincere to be by the bedside of suffering humanity; hypocrisy there cannot feign an interest which it does not feel. Hence we do not find many left to minister to our wants, of those who had pledged true friendship and had prated to us of unending affection. The touch-stone of affliction has been applied, and a base alloy, with a poor film of gilding has been found, instead of the true metal which the external appearance had indicated. Those who are true and reliable, cling to us all the closer for our sufferings. The sympathizing breast opens up all its sympathies in such a trial, and shows how reliable all its pretensions have been. Affliction is, indeed, the grand test for the friendships of this world. Those who are proven by it should be prized as above all price.

But if all friends desert us at such a time, even this itself may be, to the truly devout, a blessing, assuring them there is no love on earth equal to that which Christ himself manifests toward his suffering members. Under such circumstances, it is the rock of ages which becomes the only reliable resting-place for our hopes and expectations of succor. The Christian is drawn nearer and closer to his Saviour, and feels that from Him alone can help in time of need be expected. His faith becomes stronger, and he draws comfort from Christ as from a well of living waters.

Ordinarily, we look upon the sensation of pain as an evil, but physiology shows us, that in this we are mistaken. One of the great blessings to man is the fact that we can feel pain. It is a protection to our bodies, as it bids us attend to that which may do irremediable injury. In a state of health, man is not conscious of the existence of any special organs within his body. It is only when disease attacks the latter, that he begins to be aware of their presence, or to know that he has such organs as the stomach, liver, lungs or heart. The sensation of pain directs his attention to the seat of the disease, and enables him to reason as to the correct remedy.

The sensation of pain is dependent upon the nervous system. Where nerves do not exist, there no injury would produce pain. The nails may be pared and the hair cut without the sensation of pain. Its distribution is then to parts where its presence would be required for protection, and nowhere else. Thus the skin, which covers the whole external surface of the body, is largely endowed with nerves of sensation, not universally even distributed over it. The thick covering of the heel has different sensibility from that of the fingers. If the sensibility were great in the former, every step taken would be agony to the human frame; were it small in the latter, then the great utility of the sense of tact would be destroyed. The common idea, that bones are exceedingly sensitive, and that the marrow is peculiarly so, has its erroneousness demonstrated whenever the surgeon is called on to remove a limb. He knows that the first sweep of the knife, with which he severs the skin, produces pain beyond all other portions of the operation, that the incision of muscle and the sawing of bone will be as nothing to it. The great seat of sensation is the skin, because those substances must come into contact with it, which would be of injury to the body.

The reviewer of "Rowell's essay on the beneficent distribution of the sense of pain," in the London Quarterly, says: "Without pain, we could not proportion our actions to the strength of our frame, or our exertions to its powers of endurance. In the impetuosity of youth, we should strike blows that would crush our hands and break our arms; we should take leaps that would dislocate our limbs; and no longer taught by fatigue that the muscles needed repose, we should continue our sports and our walking tours till we had worn out the living tissue with the same unconsciousness that we now wear out our coats and our shoes."

Had we space, we might show how the sensation of pain is sometimes wonderfully acute, in some parts of the vital structure, where ordinarily no nervous sensibility appears present; and again, how it is deadened and quieted. A mere reference to the frequent cessation of pain, as the moment of final dissolution arrives, is all that can be allowed us. It is a common occurrence in many diseases, that the sensation of pain entirely disappears just before death. It has sounded the alarm from the first inception of the disease—has reported accurately the extent of the injury, so long as hope remained that nature, with the assistance of medicine, could remove it. But all its alarms have proven ineffectual, the citadel of life cannot hold out any longer against the violent attacks of disease. It must surrender; nothing in the world is to be gained by continued reports of danger. The end is at hand, and is inevitable. The sensation of pain ceases, and what a blessing that the last moments on earth can be spent with an unclouded mind —that the soul can make its peace with its God, throw off all its inimical feelings for the world, and with a quiet calm close its eyes upon the fading beauties of this life, to open upon those of another which shall be unfading and eternal. The waters of death are sometimes very dark and dreary, and the good Christian is almost forced to cry out: "Father, if thou be willing, remove this cup from me," but in the greater number of cases, the bodily anguish disappears, and the spirit longs to attain its rest where God has prepared eternal freedom from pain and suffering. Death, then, to the good man, illustrates the divine beneficence, as exhibited in the laws which govern the human body.

If the view we have taken of our subject is correct, and not one of mere fancy, it is easy to perceive that the errors which pervade general belief are by no means small or unimportant. The human body cannot be a something to be despised by man. It was made as the crowning act of God's creation; as though, through him, as the grand exponent of nature, the works of God might find a fitting agent to pour back, in articulate words, never ceasing hymns of praise and honor. The primal pair—

> Godlike erect, with native honor clad
> In naked majesty, seem'd lords of all,
> And worthy seem'd: for in their looks divine
> The image of their glorious Maker shone,
> Truth, wisdom, sanctitude severe and pure,
> Severe, but in true filial freedom plac'd,
> Whence true authority in men: though both
> Not equal, as their sex not equal, seem'd;
> For contemplation he and valor form'd,
> For softness she and sweet attractive grace;
> He for God only, she for God in him.
> * * • * * *
> Adam, the goodliest man of men since born
> His sons, the fairest of her daughters Eve."

The soul and body were then, as with all their descendants, inseparably yoked together, during this earthly life, and after a short separation, produced by death, will again be united nevermore to be sundered. Whatever joys heaven may have in store for the soul will be enjoyed by the body; whatever sorrows and torments the gloomy regions of hell may have reserved for the soul, those also will the body suffer. Both must either reign in triumph, or both suffer eternal despair. There is no prospect of a divorce of the two. The salvation which was brought to man, was not only one affecting the soul, but the body also.

And in addition to all that has been said on this subject, one other consideration may yet be mentioned as justifying all we have claimed in the way of respect for the human body. Christ Himself, before leaving his disciples, instituted the solemn Eucharistic Sacrament, calling the bread and wine, which was employed for this purpose, His body and His blood, and enjoining them to repeat this solemnity in remembrance of Him. And when the Jews, on a previous occasion had cavilled at this saying, that he would give His flesh for the life of the world, His answer was: "Except ye eat of the flesh of the Son of Man, and drink His blood, ye have no life in you." These words, involving as they do the awful mystery of the presence of Christ's real body and blood in the Eucharistic Sacrament, should make those, whose precious privilege it has been to partake of this priceless blessing, duly respect that body which has thus been the recipient of the blessed elements.

We close by another quotation from Dr. Lee: "Unless mankind shall be taught to take a conscientious interest in their bodily welfare, they will hardly be persuaded to feel that concern which they ought, in the health and salvation of their souls. He cannot be expected to aspire after eternal life who has not learned to appreciate the blessing of temporal life." "He that is unfaithful in that which is least, is unfaithful also in much."

THE

CALENDAR,

CIVIL AND ECCLESIASTICAL.

BY

A LAYMAN OF THE GERMAN REFORMED CHURCH.

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THE CALENDAR.

AMONG the strange fables which compose the structure of Grecian Mythology, we find one that refers to the god Chronos, who presided over time; an old man weighed down with years and accumulated infirmities, whose long, grey locks are moved by the passing wind, gently or rapidly as this may come in the form of the light zephyr, or the rude and stormy blast of old Boreas. In his right hand he holds the relentless scythe, with which all are cut down at the appointed time,—all, whether rich or poor, old or young; those whose years have been filled with good works and bright deeds, or those whose manly breasts are but prepared for noble encounters. The serpent biting its tail, appears by his side, the ancient emblem of time, or rather of the year. In his left hand a child is held, as if to be devoured by the god; for since he "brings an end to all things which have had a beginning, he may be said to devour his own offspring." A similar representation is given in Roman Mythology of the god Saturn, who was the father of the Olympian Jove, and one of the descendants of primeval Chaos. These representations satisfy us, that man does not require any higher illumination, than that which flows from the dim lamp of Nature, to make him conscious of the passage of time, or, that this is marked by the destruction of bright and shining members of his own race,—the darling children of an hour, petted and nursed by the delicate care of time and then subjected to the destroyer's power. The Roman poet in his Ode to Postumus, recognizes this peculiarity with much pathos, when he exclaims,*

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* Eheu fugaces, Postume, Postume,
Labuntur anni: nec pietas moram
Rugis et instanti senectae
Afferet indomitaeque morti.

* * * * * *

Linquenda tellus, et domus, et placens
Uxor: neque harum quas colis arborum,
Te, praeter invisas cupressos,
Ulla brevem dominum sequeter.
Hor. Carm. Lib. II, XIV.

"How swiftly glide our flying years!
Alas! nor piety, nor tears
Can stop the fleeting day;
Deep-furrowed wrinkles, posting age,
And death's unconquerable rage,
Are strangers to delay.
* * * * * *
Your pleasing consort must be left
And you of villas, lands bereft,
Must to the shades descend;
The cypress only, hated tree,
Of all thy much-loved groves shall thee—
Its short-lived lord—attend!"

But the flight of time, when viewed, under the advantages of a brighter light than that which illuminated the path of Horace, becomes a subject of the greatest importance to the Christian mind. It is not only the loss of time that it regrets, the nearing of the dark and gloomy tomb, the dismal boughs of the cypress or the funereal trappings which adorn the hearse on its saddest errand. These are all repulsive to the light and joyous heart, but they may be surrounded with such a halo of glory, that man "shall go to his long resting place without a tear." It is not the unknown Future that appalls. It is the misspent Past that makes him cling to life with the fond hope that some good deed may blot out the record of past omissions and commissions, and may make him worthier of a blessed reward in the Future. *This* is the Christian's cause of regret, and, notwithstanding it is based upon purer and higher and nobler reasons than that of the pampered child of luxury, yet he must finally admit that of himself he can do nothing which will repair the misdeeds of the Past, but must rely on a higher power for assistance to labor aright during life. His agonizing soul exclaims in the words of the Christian Spanish poet:

"O world! so few the years we live,
Would that the life which thou dost give
Were life indeed!
Alas! thy sorrows fall so fast,
Our happiest hour is when at last
The soul is freed."

These considerations point out one class of events as marking periods in the great Calendar of Time,—the deaths of those who have lived and struggled in the world. Wherever death comes to a human being it impresses an indelible mark upon the breast of some one who has learned to honor or to love the deceased. The event is the central point around which will revolve the memories of the Past with such a centripetal attraction that all the alluring charms of the Present will not succeed in destroying the relation. Who has not some such periods, marked with indelible impressions and draped with sombre black, in the Calendar of his own life? To these, he refers all the incidents of that life,—speaks of events that occurred so long "before he or she died," and thus binds them to his memory by *friendly* cords, even though these be entwined with cypress. We say that every human being has such periods in the arrangement of his private Calendar.

The patriot, on the bed of death, has a nation watching, with breathless anxiety, every little symptom of his disease; hope contends with despair; glad expectation with sorrow; but the moment arrives and all is over. A nation weeps and mournful dirges are borne along by the winds as they sweep over the plain. A great leader has fallen and who shall take his place? Again, the Christian father or mother is sinking under the exhausting effects of disease, and the keenest anguish fills the breasts of their children. The family circle is to be broken;—the central jewel, around which the less brilliant gems had been clustered, is to be destroyed;—that which had been the source of happiness is to be removed. When death comes, know you not the deep mark he will make in the record of each one's life, by the sorrow that he throws so overwhelmingly over the dazzling day-dreams of a happy future? And there lives no man so wretched or miserable, so wicked and lawless, but the event of his death will form a mark in the Calendar of Time precious to some heart who, it may be, loved not wisely but too well.

But if sad marks are thus made on the Calendar, bright, happy ones appear also. The birth of a child constitutes a bright epoch, which proud parents and loving relatives refer to with great satisfaction; and thus that Calendar, which marks the progress of Time for each individual, has periods both of sorrow and joy, of deep anguish and high exultation.

On the present occasion, however, we wish to direct attention to those divisions of the Calendar, that the necessities of civil life have formed, with the assistance of Astronomical Science, and also those periods, with the laws for their determination, which religion has set apart for holy services. We trust the subject may not seem too commonplace for close and careful examination. It often happens, that a common subject may be very little understood, because our attention has never been directed to it. The explanation of the Almanac, says the eminent Astronomer, Arago, involves the most delicate and intricate points of science and general learning. Let us then endeavor to seize the main facts connected with its formation, and thus be enabled to understand the divisions of time, by which events in the civil history of man are recollected and accurately fixed. The words Almanac and Calendar are used indifferently in English to represent collections of tables, containing subdivisions of time considered with reference to artificial or natural relations. The first is derived from an Arabic word, signifying *the moon;* and its derivation shows us, that the moon gave the peculiar laws by which the divisions of time were determined among the Eastern nations. Calendar is derived from the Latin word *calendae*, which were the first days of each month in the year. Whatever may have been the other subdivisions of time adopted by mankind, that into days and years was fixed, by the movements of the earth in the heavens, beyond all danger of conventional alterations.

By a day, we mean, ordinarily, the time occupied by the Sun in an apparent revolution through the firmament; in fact it is the amount of time consumed by the earth in making one entire revolution on its axis. This period is divided into two portions, one during which a part of the earth receives its light directly from the Sun's rays, and a second when the only light, sent down, is from the moon or the stars. The former is known also as day and the latter as night. This division has existed from the first dawn of creation, when Omnipotent Power spake the word and "divided the light from darkness," calling the light Day, and the darkness Night. The relation of length, however, between these two periods is not fixed for any particular spot on the earth's surface, and between any two positions there will always be great difference. At the north pole a continuous day of six months duration is followed by darkness of an equal length of time, and those who are familiar with the travels of our modern Arctic discoverers, will recollect the descriptions of those long periods of light and darkness, and how they affect the minds of men who have been accustomed to the night and day of temperate or even tropic latitudes.

The day, in the proper sense of the word, is controlled, as we have said, by the revolution of the earth on its axis, and has been divided from a very early period of history, into twenty-four parts. Sometimes these were divided into two periods,—one, that of the light, which had its twelve equal divisions, and that of darkness, which was considered as composed also of twelve equal parts. With such an arrangement, the hours of the night, during winter, would be longer than those of the day, while during the months of summer, an opposite relation would be established between the two, and no equality of hours could exist on any other days of the year than the 21st of March and the 23rd of September, when the periods of day and night are equal. The more common division of the day, however, is into equal portions, each of which consists of twelve hours.

Among some nations, as is the custom now of Astronomers, the day was not divided into two periods, but the hours were reckoned from one up to twenty-four. Astronomers follow the custom of Ptolemy, and consider noon as the commencement of the astronomical day, which of course then extends to noon of the next day. The beginning of such a day is twelve hours after that of the civil day, which takes place at midnight, and its termination is also twelve hours later than the civil day. Almost all modern nations regulate their civil day from midnight, and they employ two initial points for designating time, the beginning of the day and the middle, or noon, when the sun is on the meridian; but the relative position of any hour is regulated by its relation to the middle point, being called either the hour of the morning or the evening, as it is before or after mid-day, and the fact is indicated, in writing, by the abbreviations A. M., or P. M.

The Jews, as the pages of both Old and New Testament clearly show, the Chinese, the Italians and the ancient Athenians began their day at the setting of the sun. One can well understand how a simple people, devoted to agricultural pursuits, not given to the study and cultivation of science, would naturally select as the commencement of their civil day, either the rising or setting of that bright orb, whose beams were to give light to their path and to infuse genial warmth throughout the animal and vegetable kingdoms. These two events in the history of the day were regarded as the great facts of the natural world, to which both the activity and living energy of all that possessed life were due, since the rising of the sun was the great stimulus to action and, when aweary of continual exertion, the darkness, its setting produced, allowed of rest and refreshing repose to the animal world. There is thus a reason arising from man's relations to nature for the adoption of this notation. It also explains the reason for the form of expression which Moses employs to denote the first days of Creation,—" the evening and the morning were the first day." A writer of the present day would say, " the morning and the evening," instead of employing the old form which sprang from the mode of reckoning time in use with the Jews.

The Italians, according to Arago,* have continued this defective method down to the present time, counting the hours regularly from one to twenty-four, and giving as their reason for it, that travellers are kept in this way always reminded of how many hours they may employ before darkness shall surround them. The sun always sets at 24 o'clock, according to this calculation, and if the watch points 22 o'clock, we know that two hours will yet intervene before the close of day. But the advantages of any such system are really nothing as compared with the inconvenience attendant upon constant daily alteration of time pieces, and the impossibility of establishing any thing like a methodical arrangement of daily business. The arguments in favor of its retention must be based on blind love of antiquity, and not on any advantages that are inherent to it.

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* Astronomie Populaire, I, 268.

The same objections obtain, when we examine the method of the Babylonians, Syrians, Persians and Modern Greeks, who take the rising of the sun as the initial point of the day. This period, as well as the setting of the sun, differs daily, and hence no clock regulated by either of these events on one day would be strictly correct the subsequent day. These methods spring from an age when science was not known, but wherever it sheds its benignant rays in the present day, we find that they are abolished, unless deep-rooted affection or irrational prejudice should combine to prevent such an effect.

Whatever period may be adopted for the commencement of the civil day, it must be determined by the aid of the heavenly bodies, and thus, by a bond of necessary union we are bound to the planets and stars that shine in the immensity of space,—bound by such a harmonious relation that all our daily duties are regulated by them, while their inhabitants are in similar manner indebted to our planet and its kindred, for the arrangement and control of their daily avocations. And though our most ingeniously contrived and artistically finished Chronometers may render our divisions of the time, which intervenes between the fixed periods given by astronomical observations, somewhat accurate and reliable, yet we are obliged continually to alter them by the great regulators which the Eternal has established in the skies. As our own American orator* so beautifully expressed the idea in his oration on Astronomy—"for all the kindreds and tribes and tongues of men, —each upon their own meridian—the eternal sun strikes twelve at noon, and the glorious constellations, far up in the everlasting belfries of the skies, chime twelve at midnight; twelve for the pale student over his flickering lamp, twelve amid the flaming wonders of Orion's belt, if he crosses the meridian at that fated hour;—twelve by the weary couch of languishing humanity;—twelve in the star-paved courts of the Empyrean;—twelve for the heaving tides of the ocean; twelve for the weary arm of labor; twelve for the toiling brain; twelve for the watching, waking, broken heart; twelve for the meteor which blazes for a moment and expires; twelve for the comet whose period is measured by centuries; twelve for every substantial, for every imaginary thing, which exists in the sense, the intellect, or the fancy, and which the speech or thought of man, at the given meridian, refers to the lapse of time."

Astronomers take into consideration two kinds of days, the *sidereal*, which marks the interval of time between two successive passages of any star over the meridian, and the solar, which we have just considered, the interval between "two consecutive passages of the Sun through the meridian." The latter is the longer of the two, and constitutes that which we have called the civil day. But while this period of twenty-four hours is being determined by the revolution of the Earth upon its axis,—or the apparent revolution of the Sun about the Earth, the latter is undergoing itself a change of position in space which alters, with each instant of time, its relation to the Sun. The Earth revolves around the Sun, and this revolution requires a much longer time than that required for the revolution on its axis, giving the appearance of a constant change of position in the sun, and occupying an amount of time which is called a *year*. The year then means the number of days that are required by the sun in its apparent movements, before it returns to the same position on the ecliptic, whether this position be at the summer or winter solstices, the autumnal or spring equinoxes. It is not composed of an even number of solar days, but consists of three hundred and sixty-five days and a fraction under six hours. The difficulties which this fraction has created for astronomers and chronologists in past history, as well as the plans proposed to avoid further trouble about it, will be considered directly.

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* Everett's Discourse on the Uses of Astronomy.

The year is divided into Seasons, which divisions, although not employed as legal, yet are in use with all mankind. These are also determined by the relation of the Earth to the Sun, so that the Record in the first chapter of Genesis concerning the fourth day of Creation, can be literally interpreted, and the lights which were then established in the firmament have been not only "for signs," but also "for *seasons*, and for days, and years." These seasons are determined by the sun's apparent position on a great circle called the ecliptic, which circle is inclined at an angle of 23°, 27′, 30″ to the plane of the Equator. The sun in making its apparent circuit on the ecliptic will twice in the year cross the Equator, once in passing from south to north, and the second time on its return; these constitute the *Equinoxes.* The period of time which marks its extreme northern or southern position is called the *Solstice*. The Equinoxes take place on the 21st of March and the 23rd of September, and are known as spring and autumnal.

The solstices happen on the 21st of June and the 21st of December and are called summer and winter solstices;—these are the periods when in our latitudes we should be suffering most from intense heat or cold, but a number of modifying causes generally delays the periods of greatest heat and cold for some days beyond the Solstices. In Paris the fifteenth of July is about the period of maximum heat, and the fourteenth of January that of maximum cold.

The four seasons are thus determined by the Solstices and Equinoxes, from the 21st of March to June 21st, we have the season of *Spring*, from 21st of June to September 23rd, *Summer*, from the latter to 21st December, *Autumn*, and from that period to March 21st, *Winter*. These are the seasons, as the movements of the sun determine them for the northern hemisphere. They are the very opposite in the southern portion of our globe, the spring of the north corresponding to the autumn of the south, and the summer of the south to the winter of the north.

But we are admonished by the want of space, not to linger over this part of our subject. It would be profitable to examine more closely the nature of the effects which the Sun produces during the four seasons of the year,—to see how the scenes of nature are changed as though by magic power,—to watch the gradual disappearance of snow and ice at the termination of winter,—the gentle metamorphosis of rough and craggy ice-bergs into streams that glide down the hillside and make glad the verdure of the plain,—to pluck the floral beauties which cover the meadow,—to view, with thankful heart to the All-wise and Omnipotent God, the fields with their rich return for honest labor as the evening winds may blow across the summits of the waving grain,—or to join in the exultant shout of thankfulness that the devout heart pours forth in the song of Harvest-home. The seasons are so many periods for attracting man's attention to the wonders of Creation and the greatness of the Creator, that they form an unending theme for the philosopher and the poet. The harmony that exists throughout all portions of creation is here shown in its most wonderful form. Nothing is discordant. The Master's hand has combined all in the wondrous notes which are poured forth, by his creation, as tribute to the Creator's power. The seasons follow as regular developments of each other.

The childhood of Spring, bright and gleesome, is but the bud which will develop into the glorious maturity of Summer, destined also in time to become the matronly autumn, and to totter, in the decrepitude and cheerlessness of old age, as chilling winter to the tomb. But the end is not yet,—no! the regulations of Omnipotence have assigned to the seasons the duty of continually rehearsing their parts so long as the earth is subject to the laws of time, and thus while the earth is bearing fruit to man, is supplying his wants and providing for his comforts, it is ever preaching to him that all things are bound to decay, and that the end of natural life is inevitable death.

We have now to consider as the next division of time, one which, though enforced by civil authority, yet has its origin not in national causes, but in the religious feelings of man. The week indicates "a regular succession of days of labor and rest." It is a division of time not found among all nations, but has existed from the earliest periods among the Chinese, Jews, Egyptians, Chaldeans and Arabians. We shall see on examining the etymology of the English names of the days of the week, as well as those employed to designate the latter by the French, that they are associated in some very intimate way with the names of the Grecian and Roman deities, or with those of the Northmen;—the English being derived from Saxon and the French from the Classic mythology. Sunday is the day of the Sun; Monday that of the Moon; Tuesday that of Tuisco, a deity corresponding to Mars; Wednesday that of Woden or Odin —the Alfadur or All-father, who regulated the seasons by the creation of the sun and moon, and along with Vili and Ve—the other two gods, who were formed in the beginning,—created man, Odin granting him life and soul, Vili reason and motion, and Ve the senses and speech; Thursday is the day of Thor—the god of thunder; Friday that of Frigga the wife of Odin; and Saturday the day of Saturn. We observe then of the seven days that their names are the same with those of the seven planets known to the ancients, viz: the Sun, the Moon, Mars, Mercury, Jupiter, Venus and Saturn. The etymology of the names justifies the conclusion that they were given for astronomical reasons, and thus the week contains "traces of some ancient astronomical system," which is not clearly understood at the present day. Various explanations have been given of the peculiar nature of this ancient astronomy, but none seem satisfactory. Arago advances the idea also that special virtues were attributed to the number seven by the ancients, and that "no one would have dared in Egypt, Greece or Rome to announce the existence of more than seven planets, as it would have been an infringement on the prerogatives of the number seven which would have entitled him to the maledictions of religion, and the punishment would have been death." The *first* day of the week is necessarily to be determined by ancient observances. The Jews, who give us the fullest records of the early establishment of the division of time, celebrated, in accordance with the fourth commandment delivered to Moses on Mount Sinai, that day as peculiarly sacred on which God "*rested*," after the works of creation had been accomplished, and especially blessed and sanctified. This is called the seventh day in the second chapter of Genesis, and the Sabbath day in the twentieth chapter of Exodus, and is still celebrated by the Jews, as it has always been, on Saturday. From this we observe the right that Sunday has to be called the first day of the week.

The division of the week has never been rejected by any nation that has once adopted it, with a single exception—that of France. In 1793, when the misnamed Republican party held the power over that fair land, Infidelity had become so widely diffused that the traces even of religious customs could not be retained. A general destruction, of all that savored of an acknowledgment of religion or its rites, was effected amid bacchanalian orgies and satanic revelry. The week with its one day, nominally at least, devoted to the service of the great Ruler of the earth, could not be permitted to remain. The very name of that day—Dimanche—a corruption of dies Dominica, the Lord's Day, would be a continual rebuke to the vice and crime of the government. Hence, the week must be abolished, and in its stead a period of ten days, called a *decade*, established.

For a period of thirteen years this arrangement was carried out, and the outrage upon the express command of the great Jehovah perpetrated by a government steeped in the filthiest vices and the grossest profanation of religion and its laws. But "man proposes and God disposes,"—the *decade* of the godless man of science—of the blaspheming infidel, has been rejected from the records of history; and the week with its regular days devoted to labor and toil, and its one day consecrated to the service of God, has again been restored, even in France, as a regular division of time.

The week was due to religious authority; by this it was established, and hence the necessity of its preservation, and its importance, as a division of time, is as great as though it had been regularly derived from astronomical laws. Days and years are produced by the phenomena which these laws exhibit,—they follow each other with unfaltering regularity, and form an unbroken series extending from the primal creative fiat—let there be light—down to our own time. Each one has first existed as a possibility in the future, then as an actuality in the present, abounding in its human sorrows and human joys, and finally has been reckoned among the things of the past—adding one to the number of the spectral column whose grim ranks constitute the skeleton of history. The week, however, has been appointed by God himself, not as the effect of any preordained laws, or as a consequence of their operations, but by special and direct command. Hence, it claims our special veneration,—our due acknowledgment. Violate we may the great law of nature that "day is the time for work," and night that of rest, and the consequences will merely be an exhaustion of vital energies, and a complete undermining of the constitution. We may disrespect the year, with its sequence of seasons, may sow the grain in summer, or in the midst of winter, may clothe ourselves in the thin apparel of July and endeavor to breast the storms of December, and the consequences will only be bodily want and suffering. But if we violate the week, a higher punishment awaits us. We have violated that which was solemnly established amid the most impressive manifestations of Omnipotent power, and have boldly claimed the right to use that which He declared was "the Sabbath of the Lord thy God." The punishment for this is greater and more enduring than that for the violation of the day and the year. In the latter case, the consequences are confined to time,—in the former, they extend through the boundless limits of eternity—the immense ocean in which time floats like a small bubble of foam, sparkling for a while in the colors that its own walls have produced by the decomposition of the pure light that has visited them from the Eternal Sun, and then swallowed up in the great waves without a trace left behind.

Months were doubtless first adopted as a matter of convenience. The memory would find it very inconvenient to recollect particular circumstances, if the three divisions we have thus far considered, were the only means of expressing intervals of time. It was desirable that the weeks should be grouped together and a name be given to such groups. In addition to this, however, we have some reason to believe that they were originally constructed in accordance with the movements of the moon, and that the period of time required for *its* changes constituted a month. This idea is sustained by the etymology of our word month, which is derived from the Saxon *monath*, and it from *mona*, the moon. In like manner the words employed in other languages for month are derived from the word used to indicate the moon. The time required for a complete revolution of the moon from one point in the heavens to the same point again, or that consumed between any two full moons, or new moons, constitutes a lunar month. This forms a period of about twenty-nine and a half days. In common parlance four weeks are considered as making a lunar month, so that the year, if this were true, would consist of thirteen lunar months.

The revolution of the moon soon ceased to regulate the months of the year. A division into lunar months might have been found inconvenient, and it certainly must have been as unmanageable as the Italian method of reckoning time from sunset. Had the moon performed its revolution in an even number of days, there would have been no difficulty about it, but as there was a fractional portion of a day in the time employed, the lunar period was unsuited for civil purposes.

The Egyptians adopted a plan for dividing the year, which was evidently based upon the idea involved in the lunar periods. The month consisted of thirty days. Twelve months formed the year, but there was always added five *complementary* days to the last month, before the reckoning began with the New Year. This would give three hundred and sixty-five days to the year. The Egyptians called the months Thoth, Paophi, Athyr, Choéac, Tybi, Méchir, Phaménoth, Pharmouti, Pachon, Payni, Epiphi, Mésori. The complementary days are called Nisi, for the common year, and Kebus for the intercalary by the modern Cophts. A system, very similar to this Egyptian system, was introduced into the French Republican Calendar of 1793,—that is the division of the year into twelve months of thirty days, with five or six complementary days, which were called, in consequence of their Revolutionary origin, *sans-cullotides*.

The Greeks divided the year into twelve months, which were alternately of thirty and twenty-nine days, and the deficiency was made up by an intercalary month. Their months were divided into three decades, and the days these contained were numbered from one up to ten. The months always began with the end of one moon and the beginning of the other. There was, however, no general system adopted throughout Greece, and different States employed months of different length.

To the Roman system of dividing the year our attention is particularly invited, since the names of our months have mostly been derived from theirs. The Roman Calendar first consisted of ten months, and the year began with what is our third month. This was called Mars, after the god of war, from whom Romulus was asserted to have descended. The second month received the name of April from the verb *aperire*, to open or unfold, as the earth was then unlocked from the severity of winter, and, softened by the warming rays of the sun and melting showers, the buds began to appear and prepare the way for vernal flowers. The third was dedicated to Maia, the daughter of Atlas and Pleione, who was the mother of Mercury, and eventually one of the stars constituting the constellation known as the Pleiades. The fourth was consecrated to Juno—the wife of Jupiter and the Queen of Heaven. The remaining six months of the Roman year, as established by Romulus, received their names from their numerical position, and were called *Quintilis*, Sextilis, September, October, November, and December. The additional months added by Numa, were called January, from *Janus*, who presided over the gates of heaven, and hence this month was then employed as the commencement of the year, and February from the word *februa*, signifying sacrifices for the spirits of the dead, which were offered during this month. We have preserved all these names, excepting Quintilis and Sextilis. As Julius Cæsar was born in the month Quintilis, its name was changed to that of July, and the name of August was given to the month Sextilis, in honor of Octavius Augustus, who became a consul during that month.

The Roman months were divided into three unequal periods, the first days of which were known as Calends, Nones and Ides. The Calends occurred on the first day of the month, the Nones on the 5th or 7th, and the Ides on the 13th or 15th. The days between these dates were characterized by their distance from the next festival, so that the days of the month after the Ides, would be called so many days *before* the Calends of the next month, those after the Calends so many days before the Nones, and those after the Nones so many before the Ides. The whole year consisted of but three hundred and fifty-five days, and in order to make the correction necessary on account of the inadequacy of this number of days to complete the period consumed in the revolution of the earth around the sun, an intercalary or supplementary month was added every two years.* This was called Mercedonius, and was inserted between the 23rd and 24th of February. This addition was made in order that the civil and the astronomical year might commence on the same day, at least every other year. The month Mercedonius some years was longer than others, in order to bring about this agreement, and the determination of its length was left to the High-priests. This power gave rise to great corruption, as it rendered its possessors able to shorten the period of office for their enemies and lengthen it for their friends. Confusion of the most annoying character invaded the chronologic reckoning of the Romans, until we are told that the autumnal festivals were celebrated in the spring and those of summer in the middle of winter.

This state of affairs attracted the attention of Julius Cæsar, and the result was the Julian reformation of the Calendar. It was accomplished with the aid of the Egyptian astronomer Sosigenes. The first object was to have an *intercalation* for the deficiency of the civil when compared with the astronomical year, which should be regular and free from alteration, and the next was to compensate for the fractional portion of the day which was appended to the three hundred and sixty-five days in order to make up the astronomical year. This latter object was accomplished by giving the civil year a definite number of days, omitting the fraction, and adding one day every four years to the number contained in the year in order to make up for the omission. The ordinary year would contain three hundred and sixty-five days, while every fourth year would have three hundred and sixty-six. The month Mercedonius was rejected and the days were apportioned out through the other months of the year, just as we have them at present in use over the whole globe, wherever civilized man dwells.

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* Arago, Astronomie Populaire, iv., 665.

The intercalated day was added to February, which has every fourth year twenty-nine instead of twenty-eight days; and instead of counting it as a separate day, Cæsar adopted the plan of reckoning the 24th of the month twice, and as this day was called *sexto-calendas,* the repetition of it received the name *bissexto-calendas,* or simply *dies bissextus,* whence our own name, given to the year of three hundred and sixty-six days—*bissextile.* This Julian reformation took place forty-five years before the Christian Era. Owing to the imperfect manner that the bissextile day was employed, Augustus had the Calendar again corrected, thirty-six years after the date of the Julian reformation.

The whole Julian reformation was based upon the idea that the revolution of the earth around the sun was accomplished in three hundred and sixty-five days and six hours, whereas in fact it occupies but three hundred and sixty-five days, five hours, forty-eight minutes, forty-nine and seven tenth seconds. The Julian Calendar could be employed for a number of years without any great inconvenience, but as the mean length of its year differs from the astronomical year, a period must eventually arrive when there would be important differences between the two, and the seasons, according to the Calendar, would be very different from those which were occurring in fact. The council of Nice, in 325, adopted a plan in order to determine the festival of Easter, based upon the supposition that the vernal equinox would take place always on the 21st of March. But if the civil year is considered as being three hundred and sixty-five and one fourth days long, then, in consequence of the greater length of this period, the following error would arise, the equinox would fall a fraction of a day earlier than the Calendar would call for it. This difference, though small, would be increased with each year until it would at length be days instead of minutes. While the Calendar would lead us to expect it on the 21st of March, it would take place on the 20th, 19th, 18th, &c. As we shall find hereafter, Easter is regulated by the period of the Vernal Equinox, and these differences between its real appearance and the time claimed for it in the Calendar, turned the attention of the Church to the necessity of a new reform of the latter. This reform was accomplished under the authority and direction of Pope Gregory XIII. in the year 1582. In the 1257 years that had elapsed since the Council of Nice, the Julian year had gained ten days on the astronomical year, and in 1582 the Vernal Equinox fell on the 11th of March instead of the 21st. The Council of Trent had recommended that some means be adopted to rectify this error. The Pope ordered that the day after the 4th of October, instead of being called the 5th, should be called the 15th. This reform was not considered as complete, however, until there should be some law established for preventing the same difficulty hereafter, and to make such a law an edict was promulged that in every four hundred years there should be only ninety-seven bissextile years, instead of one hundred, which the Julian Calendar allowed. This would cut off three days from every four hundred years, giving a mean length to the year somewhat longer than the astronomical year, but so little differing that there would be a gain of one day only in four thousand years.

The rule for bissextile years is that every year divisible by four is entitled to the extra day appended to February, but that those years which terminate as 1500, 1600, 1700, 1800, &c., and which are really divisible by four, must be divisible first by one hundred and then by four, in order to be considered bissextile. In this way in the space of four hundred years, three years which would be bissextile according to the Julian Calender, will remain common, that is, will contain but three hundred and sixty-five days, and thus, in every one hundred bissextile years, according to the Julian Calendar, there is retained but ninety-seven, according to the Gregorian.

In the year 1700 the difference of dates between the two Calendars became equal to eleven days, and in 1800 to twelve days. The dates, according to the Julian reckoning, are now known as "the old style," and those according to the Gregórian as the new style. The Julian system is still employed in Russia, and consequently there is a difference of twelve days between the dates of events as recorded by the Russians and by other nations.

There was great objection at first in Protestant countries to the adoption of the Gregorian changes in the Calendar. The great religious movements of the day which had resulted in a denial of papal supremacy by a portion of the Western Church, and a rejection of the customs and usages that were peculiar to the Church of Rome,—these were but little calculated to admit any agreement on the part of either Roman Catholic or Protestant on subjects religious or scientific. The sturdy Protestant declared that he would rather not agree with the sun than agree with the court of Rome, and therefore hesitated a long time about adopting the Gregorian changes. The decree of the Pope established the Gregorian Calendar on October 5–15, 1582. It was adopted in France, December 10–20, 1582 ; in the Catholic kingdoms of Germany in 1584, and the Protestant in February 19–March 1, 1600 ; in Poland in 1586 ; and in England September 3–14, 1752.

We have thus traced the history of our civil year, from its first establishment by Romulus, down to the changes which were instituted by Gregory XIII, under the advice of Lilio. It will be seen that centuries elapsed before science succeeded in defining not only the Calendar for any fixed year, but in obtaining the law of the variations of the Julian from the Astronomical year. It would be an error if we were to conclude that the civil year always commenced with the first of January. Arago gives five different periods which were or are employed by different modern nations as the beginning of the business year.

The birth day of Christ, December 25th, was celebrated as the beginning of the year in France during the reign of Charlemagne. In the same country, about the year 755, the first of March was selected as the commencement of the civil year; and during the 12th and 13th centuries, Easter day, notwithstanding it is moveable between the

22nd of March and the 25th of April, was used by some of the French. Up to 1752 in England, the year began with the festival of the Annunciation of the Virgin Mary, which was celebrated March 25th. During the year 1751, Parliament determined that 1752 should be considered as commencing with the first of January. In this way, 1751, really consisted of but nine months, and the ignorant populace are said to have vented their indignation upon the authors of the bill, pursuing Lord Chesterfield with the cry "give us back our three months." The first of January was retaken as the beginning of the year by the Germans in 1500. It is now adopted by nearly all nations excepting the Russians, where the commencement of the year corresponds with our thirteenth of January.

A few words on the subject of Eras and we shall take up the second portion of our subject. It is necessary to have some fixed point in the history of the past from which we can reckon the dates of events. In the years we have months, in these weeks, and in these again days, and thus we are enabled readily to fix the date of an event that may have happened during either of these periods. We want something of the kind when we have to fix the particular year of an event, and this is furnished by the Era.

The two Eras adopted by Christian nations have been the date of the creation of the world, and that of the birth of our Saviour. All events are referred to these two great facts. They constitute the Era of the world, and the Christian Era,—the first birth of matter with the creation of its master man, and the birth of the greatest man, of Him who united the natures of God and man, so that the sin and iniquity of the natural man might be sufficiently atoned for by His great sacrifice. The event which constituted the second Era was not only the greater of the two, but was the period in the history of the world towards which its antecedent events were looking for the restoration of Humanity to its original relations with the Deity, and from which those incidents, that have occurred since, have flown with more or less benefit to the race as they have been controlled by a spirit recognizing the importance of *the* great event.

The Era of the world was proposed early in the history of the Christian Church, probably as early as the days of the Apostles. Chronologists have differed as to the number of years which intervened between the two Eras. Scaliger advanced the opinion, that this was 3950, Archbishop Usher that it was 4004, and Josephus 4163 years. The estimate of Usher is most generally adopted by English writers, and has been recognized by Bossuet and Rollin. The Era is called *Anno Mundi*, and abbreviated by the use of the initials A. M. The years are estimated from the beginning in regular order up to the Christian Era, which necessarily constitutes the beginning of the four thousand and fifth year of the world.

We find that the birth of Christ was not taken as the initial point of a new notation of years until the sixth century. The Christian Church had no Era different from those employed by the non-christian communities, and we may conclude, that the Era of the world was used, or the Olympic Era which dates 776 years B. C., or the Era of the foundation of Rome, known as *Anno Urbis Conditae*, which dated 753 years B. C., and was represented by the letters A. U. C. In the year 532 of our Era, a Roman monk, Dionysius Exiguus, proposed that the birth of the Saviour should be adopted as the point of time to which all events belonging to the Christian portion of History should be referred. His calculation placed this event on the 25th of December, in the 753rd year after the building of Rome, and accordingly the 754th year was called the first of the new Era,—taking, however, the first of January, seven days after the supposed Anniversary of the event, as the beginning of the year. Any event in this Era is said to have happened in the year of our Lord, and, designated by adding the letters A. D., (abbreviations of the words *Anno Domini*) to the number of years after the birth of Christ. In this way the nominal Christian world, whether recognizing fully the doctrines of the Christian religion, or possessing full belief in the idea of the divinity of Jesus Christ, are unconsciously, in their modes of reckoning time, bearing witness to His birth as the grandest incident found on the pages of the world's history. Men, whose undevout lips were never moved in prayer, or whose hardened hearts never beat in sympathy with a religious idea, thus inarticulately join in rendering homage, all involuntary though it be, to the central fact of the world's history,—the wondrous basis of the Christian's hope and the Christian's trust.

We have thus endeavored to present the nature of those divisions of the Civil Calendar, that are required by the exigencies of civil life, and also the principles, whether arbitrary or astronomically necessary, which have regulated the construction of such divisions. The day and year have been shown as regulated by astronomical laws. When these laws were but indifferently understood, the lengths of those divisions of time were not accurately fixed. After science had cleared up the dark places in Astronomy, she taught man how the civil year, by which he regulated his business affairs, could be made to agree with the astronomical year that the sun and the earth determined. Then, and not before, was the year accurately fixed. Hence we can understand all the mistakes and errors which abounded in every determination of the year up to the time of the Gregorian reformation in 1582.

Months being arbitrary divisions of the year depended entirely on the correctness of the determination of the latter for their value. But, weeks were established by especial command of the Almighty, and depended alone upon the preservatien of the seventh day, however accurately or inaccurately its length might be determined by man, free from all labor or work.

The civil year is devoted to the worldly business of man. Saving alone fifty-two days—the Sundays—all the year is devoted to the search of such things as will contribute to his wants, comforts or luxuries. The requirements of the body are food and raiment, and these constitute all that are supplied by the labors of most men. The want of the mind is knowledge, not only that it shall be able to aid the body in gaining victories over material objects, but that it can investigate the nature of substances immaterial and eternal. This want as imperatively clamors for man's attention during the civil year as the necessities of the body which perishes, and he who neglects its call, lowers himself to the condition of a mere animal. But yet a higher want is experienced by his soul, which *can* only be satisfied by food that Omnipotence has placed within its reach, and this want is the highest of all, so that whatever may be the occupations of the civil year, *it* must not be neglected. The business of man consists, therefore, in providing for the spiritual, mental and bodily wants of himself and those constituting his family. One day, out of the seven constituting the week, was reserved by God in commemoration of His sovereignty, and is specially to be devoted to the first of these three classes of wants, although it must also occupy a portion of time during the other six days. This day was originally fixed on the seventh day of the week, but, "it was changed, by the Lord of the Sabbath, from the *seventh* to the *first* day of the week, that it might be, till the end of time, a memorial of his resurrection from the dead; while, being still unaltered in its essential nature, it should continue to answer, also, as before, all the purpose of its original institution."*

From the earliest times the ancient Christians celebrated certain days of the year in commemoration of great events in the life of Christ. Whether these days were the proper anniversaries of such events or no, the idea involved in the celebration was still the same—that the creature should hold in continual remembrance the life of his Saviour. Afterwards, other days were added in commemoration of the births or martyrdoms of the Apostles, Evangelists, Confessors and Saints. These were multiplied until each day in the year was considered as consecrated to the recollection of some religious fact or personage. The *propriety* of such commemorations does not come within the province of this Article. It is taken for granted; the reasons for it being based upon the conclusions which the Church Catholic has adopted. The number of the days which should be celebrated differs in the various branches of the Christian Church. Their enumeration constitutes the Ecclesiastical Calendar, and this is different in extent with each separate Church. The Roman Catholic Church has given the name of a Saint or Martyr to each day in the year, and has even assigned one to the intercalary day—the 29th of February. Protestant Churches have abridged this number and have adopted many or few of them in accordance with their own special theory on the subject. To consider the reasons for or against the retention of any of these days is, also, foreign from our present design. The Ecclesiastical Calendar, as recognized by the present Liturgy of the American branch of the German Reformed Church, and by the ancient usages of the mother Church in Germany and Switzerland, will now claim our attention, as something *admitted* to be right, and we will endeavor to show the laws which determine the various periods in this Calendar. Such a Calendar even existed with the Romans, who distinguished among the days of the year, such as were *dies juridici*, and *dies feriati*, that is judicial and non-judicial days. No man could be compelled to appear before the praetor on the dies feriati, and no business was transacted, unless of a certain character, which was specially named by Law. These days numbered, in the time of Marcus Antoninus, 150.*

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* Nevin's Biblical Antiquities, II, 163.

Some religious observances, as Christmas and Epiphany, always occur on the same day of the month. There are others which occur on different days, and hence are known as *moveable* holydays. It will be proper, to begin with those that are fixed, and we select first of all *Christmas day*, or the Anniversary of the Nativity of Christ. "This has ever been kept with great solemnity, festivity and rejoicing."†

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* Neal's Fasts and Feasts, 5 and 6.

† Calendar of Anglican Church, 152.

It was celebrated for about three hundred years by the Eastern Church on the 6th of January, though the 25th of December has been mostly devoted to its celebration. In the words of Saint Chrysostom,* it "is the most venerable, most astonishing of festivals, the fountain whence the other great festivals flowed, for had Christ not been born he would not have been baptized, which is the Epiphany; he would not have been crucified, which is the Passover; he would not have sent down the Spirit, which is Pentecost. But not only on that account, is this festival worthy of pre-eminence, but because what happened upon it is more astonishing than what happened on the others: for that Christ should die was a natural consequence of his having been born a man; for though he did no sin, yet he had assumed a mortal body; but that being God, he should be willing to become man and endure to humble himself to a degree which thought cannot follow, is most awful, most full of amazement.

Connected with the celebration of Christmas day, and immediately following it are three festival days recognized by the Church, as commemorating the martyrdom of St. Stephen, the beloved disciple St. John—the bosom friend of Christ, and the slaughter of the Jewish children by Herod's command; these festivals always fall upon the twenty-sixth, twenty-seventh, and twenty-eighth days of December. They are celebrated immediately after Christmas, since each commemorated a certain form of martyrdom, and thus the idea was symbolized, to employ the words of the rubric for St. Stephen's day, "that the terrestrial birth of our Saviour is immediately followed by the death, that is the celestial birth of His martyrs." The reason for the order in which these days are placed is given by Wheatly, "That as there are three kinds of martyrdom, the first both in will and deed, which is the highest; the second in will but not in deed; the third in deed but not in will; so the Church commemorates those martyrs in the same order: St. Stephen first, who suffered both in will and deed; St. John the Evangelist next, who suffered martyrdom in will but not in deed; the holy Innocents last, who suffered in deed but not in will."

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* Neal's Fasts and Feasts, 10.

The festival of the circumcision of Christ, is celebrated on the first day of the year, and hence is known as New Year's day. Its celebration does not date further back than the end of the eleventh century. Since this day was taken as the beginning of the year, at the time of the establishment of the Christian era by Dionysius Exiguus, it has become a day of great importance both in the Civil and Ecclesiastical Calendar. Some kind of celebration always takes place, either religious or social, and men of business use it as a convenient initial point for their calculations through the year.

The festival of the Epiphany, or the manifestation of Christ, is celebrated on the sixth of January. It is intended to commemorate three several manifestations of our Lord: 1st, the appearance of the Star in the East, which guided the wise men to the place "where the young child was," and thus enabled them "to worship Him"—this peculiar Epiphany is mentioned in the gospel for the day; 2nd, the manifestation of the Trinity as shown at His baptism in the Jordan, by John the Baptist; 3rd, that of His Divinity or Power as shown in the miracle of the water turned into wine at the marriage supper in Cana of Galilee.

These constitute all the fixed festivals that are provided for by the Liturgy, and our attention must now be directed to the more difficult subject of the moveable holydays. It will be proper in considering these to begin with the Ecclesiastical year, which does not commence with the first day of the Civil year, but some weeks before it. The commencement of the Ecclesiastical year is regulated by St. Andrew's day—November 30th,—and takes place on the nearest Sunday, before or after it, which is called the *First Sunday in Advent.* The whole season of Advent, which fills up the space between this Sunday and Christmas, is devoted to the commemoration of the coming of our Saviour. It has been suggested that St. Andrew's day was selected by the Church to regulate the first Sunday in the year, because he was "the first that found the Messiah, and first brought others to Him," and hence it was right that he should be commemorated at the beginning of the Advent season. But since the first Sunday in Advent may come before the 30th of November, this idea would not always be represented in the arrangement of the Church year. We employ St. Andrew's day to determine the beginning of Advent, although there are no special lessons and collects assigned it in the Liturgy.

There are four Sundays in Advent, each having a special gospel, epistle and collect assigned it. After Christmas, to Epiphany, there may be one or two Sundays. The Reformed Liturgy, and the Book of Common Prayer, have a gospel, epistle and collect but for *one* of the Sundays—the latter ordering these to be used "*for every day after unto Epiphany.*"

The remainder of the moveable feasts in the Church year, as well as the celebration of Ash Wednesday and Good Friday, depend upon the date of Easter, or the Festival of the Resurrection of the Saviour from the tomb. The derivation of the word Easter from a Saxon word, *Oster*, which means to rise, shows that the character of the day is manifest in its etymology. Easter day was celebrated at the Paschal full moon, in consequence of the relation of the Resurrection to the Passover. Lardner tells us,* that "many of the early Christians held Easter to be the Jewish Passover continued as a Christian rite, and celebrated it on the day of the Passover, instead of the Sunday after. The Nicene Council put a stop to this notion and practice; and means were taken at the Reformation of the Calendar to prevent the Christian festival from falling actually upon the same day as that of the Jewish Passover."

In forming the law for the fixing of Easter, two things had to be kept especially in view; first, the fact of the occurrence of the Resurrection *about* the Vernal Equinox, and second, that it was *after* a full moon. With these facts the idea was quickly obtained that the festival should be celebrated on the Sunday which next succeeded the first full moon after the 21st of March, and in case "the full moon happens upon a Sunday, Easter day is the Sunday after." From this law we shall see that the earliest day on which Easter could fall would be the 22nd of March, and that this would only occur *when* the full moon appeared on the 21st of the month, the day of appearance being Saturday. The latest period for the festival is the 25th of April, which occurs when the full moon happens on the 20th of March. This moon is not then considered the Paschal moon, as it is *before* the Vernal Equinox, and the true Paschal full moon will really occur on the 18th of April. Should this day be Sunday, according to the general law, Easter will be the *next* Sunday, which would be the 25th. Easter day has fallen on the 22nd of March, in 1598, 1693, 1761, 1818, and will occur on that day in 2285. It has been celebrated on the 25th of April in 1666, 1734, and will be on that day in the years 1886, 1943, 2038 and 2190. Between these two periods,—a space of thirty-five days—Easter may happen in accordance with the conditions first named, and as it controls most of the moveable festivals, their position in the Church Calendar may vary within the same limits, i. e. thirty-five days.

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* Lardner on The Almanac, 9.

It would be erroneous to conclude from what has been stated as the law for determining Easter, that the Astronomical moon has any thing to do with it at the present day. Many changes have taken place in the science of Astronomy, since Easter day was fixed by the Church. Ideas about the movements of the Sun and Moon, then prevalent, have been rejected. This rejection would necessarily affect, more or less, the determination of Easter, but in order to preserve the old law, an ecclesiastical, or conventional moon has been created, by the age of which Easter is regulated. Easter is in fact determined by finding the first Sunday that succeeds the 14th day of the first ecclesiastical moon which occurs after the 21st of March, and if this 14th day occurs on Sunday, the Easter festival is celebrated on the next Sunday. In order to show that there is a difference between the Sundays which would be selected as Easter by the astronomical and the ecclesiastical moon, two cases from Arago may be cited. In 1798, Easter according to the astronomical moon should have been on April 1st, but, in fact being regulated by the hypothetic moon, it occurred on the 8th. In 1818, the day was determined astronomically as the 29th of March, but was celebrated in accordance with the ecclesiastical moon's indication on the 22nd. The reason why the determination is not made by the *actual* moon, consists simply in the fact that *its* position is obtained from astronomical tables, which are yearly being altered, as the science becomes more perfect. These tables are not constructed for many years in advance, and the Church would thus be dependent for the fixing of Easter on the appearance of the Civil Calendar. Whereas, according to the present system, tables are furnished us of the days, on which Easter will fall, for centuries to come.

The ecclesiastical moon is regulated by data known as "epacts" and "golden numbers." It is free from the contingent effects of modern astronomical discoveries. We shall endeavor to explain its peculiarities, drawing from Arago, Lardner and such other sources as are within our reach.

Meton remarked that nineteen years contain about two hundred and thirty-five lunar months, and that after the termination of this period, the same phases of the moon recurred on the same days of the month. Hence every nineteen years, festivals that were regulated by the phases of the moon, could be celebrated on the same days of the month. Such a period of time received the name of the Metonic Cycle. The Greeks were so delighted with this discovery, which would require them only to determine the dates of their feasts for nineteen years, as they would then have these for every subsequent period, that they had the numbers inscribed on their monuments in letters of gold. Since that time, the numbers composing the cycle of Meton have been called golden numbers.

When we compare the actual length of nineteen astronomical years with two hundred and thirty-five average lunar months, a difference appears of two hours, four minutes, thirty-three seconds. If the nineteen years exactly contained two hundred and thirty-five lunar months, "the whole course of time would be resolved into a succession of periods, or *cycles*," and the same phases of the moon which were noticed in any year of one cycle, would occur in the corresponding year of another cycle at the same moment of time exactly. But as nineteen astronomical years fall short by two hours, four minutes, thirty-three seconds of the length of two hundred and thirty-five average lunar months,—the same phases of the moon would occur on the same day every nineteen years, but exactly two hours, four minutes, thirty-three seconds later.

But here another difficulty arises, the astronomical year is always three hundred and sixty-five days and nearly six hours in length, while the civil year is of unequal length. Every fourth year it contains three hundred and sixty-six days, and in the next three, only three hundred and sixty-five. This would also prevent a cycle of civil years always being of the same length, as it may sometimes contain five and sometimes only four leap years, making a difference of one day in length. "If four successive cycles of nineteen civil years be taken, three of them will exceed one astronomical year by something less than a quarter of a day, and the fourth will fall short of an astronomical year by something more than three-quarters of a day. The total length of the four successive cycles of nineteen civil years will be as nearly as possible equal to four cycles of nineteen astronomical years."* From these facts we learn that "the cycle of nineteen civil years oscillates at each side of the cycle of nineteen astronomical years." The

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* Lardner on The Almanac, 13.

Ecclesiastical or true Paschal moon is supposed to move in the path of the true moon, but its periodical phases take place in accordance with the civil year, just as the phases of the true moon occur in accordance with the astronomical year. This fictitious moon will sometimes have its phases sooner or later than the real moon, though the extent of the differences will never be greater than that of the difference in length between the average and the real lunar month.

All time is divided into Metonic cycles of nineteen years, the first of which is supposed to commence with a day which is the last of the moon's age. The *golden number* for any year indicates its position in such a cycle, as for instance, if we say that this number for 1858 is 16, we mean it is the sixteenth year in the cycle which must have commenced with 1843. "The age of the ecclesiastical moon on the first day of the first year of the cycle being known, its age upon the first day of each succeeding year of the cycle may be determined. The number which expresses the age of the moon on the first day of any year of the cycle is called the *Epact* of that year." Now by calculation the following Epacts have been obtained as corresponding with the different golden numbers.

Golden Numbers.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Epacts.	0	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18

Having thus obtained the age of the moon at the commencement of any year, we can easily calculate what full moon, or rather what fourteenth day of the lunar month occurs first after the 21st of March, and then from this the Easter day is readily obtained. Applying the rule to the present year the Epact for which is 15, we find the first ecclesiastical lunar period expired on the 15th of January; the second on the 13th of February, the third on the 14th of March, and the fourteenth day of the next moon falls on March 28th, which happens to be on Sunday, and hence the next Sunday, or April 4th, is Easter day.

Easter being determined in this way, there is no difficulty in fixing the remainder of the moveable festivals. Lent consists of forty days before Easter, independent of Sundays. It begins with Ash Wednesday, which is exactly forty-six days before Easter. The name appropriated to this day was obtained from the ancient custom of placing ashes on the heads of the people after they had made confession of their sins. The day was preserved as a solemn fast. The period of Lent was instituted, as suggested by some, with a view to commemorate the fast of forty days and forty nights which Christ endured in the wilderness when he was tempted of the devil, or, as is more likely, in order to bring more especially before the minds of Christians the sufferings and death of the Saviour. The period was not begun as early as Ash Wednesday, until about A. D. 600. Before that time, it seems to have been of shorter duration.

The three Sundays before Ash Wednesday are counted backwards as the First, Second or Third Sunday *before* Lent, and are also known as Quinquagesima, Sexagesima or Septuagesima. The Sundays intervening, from Epiphany to Septuagesima, are numbered by their distance from the former festival, and they may vary from *one* to *six*.

During the Lenten period the Sundays, six in number, are reckoned from the first to the sixth in their order *from* Ash Wednesday. The *sixth* Sunday, however, is called Palm Sunday, as it commemorates Christ's triumphal entrance into Jerusalem when "a very great multitude spread their garments in the way; and others cut down branches from the trees and strewed them in the way." In the Roman Catholic Church, sprigs of evergreen are worn by the members on this day.

Palm Sunday, or the Sunday *before* Easter, is the beginning of the last week in Lent, which is known as Holy Week. This season was selected by the Christian Roman Emperors as the period for pardoning prisoners, "to imitate," according to St. Chrysostom, "as far as might be, the divine goodness which, at this time, freed mankind from the dominion of sin." It was considered as a week of especial solemnity. The rubric in the Liturgy requires "that there should be Divine service every day, and that the entire gospel history of Christ's Passion and death should be read." The words of Chrysostom will give us an idea of the importance attached by the early Church to this period; —"in this week, the long war was brought to a close, death was quenched, the curse removed, the tyrannous empire of the devil overthrown, his goods plundered, God and man reconciled; heaven becomes accessible, men and angels were joined together; what had been dissevered was united; the partition wall broken down, the barrier taken away; the God of Peace made peace between the things above and the things on earth."

On the Friday in this week, known as Good Friday, the anniversary of the Crucifixion is celebrated, and the Church directs the minds of its members to the nature and magnitude of the Sacrifice which was then offered up for the benefit of mankind. This was the great fast day of the year with the early Church, and special canons of its various Councils were directed against any indulgence in feasting on Good Friday, "prohibiting such persons from participating on Easter in the sacrament."*

Saturday of this week is celebrated as the anniversary of the day in which Christ occupied the tomb, and is known as Easter Eve. The early Church continued the fast of Good Friday, "for all who were able to bear it, over the succeeding Saturday, while Christ continued in the tomb, till cock-crow on Easter morning: and during the whole of that night the people continued assembled in the churches, in the expectation,—an expectation apparently derived from the Jews,—that on that night the Messiah would appear to receive his kingdom."

Monday in Easter is celebrated by the German Reformed Church. The Gospel for the day describes the meeting of the risen Saviour, with two of the disciples, on the road to Emmaus.

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* Fasts and Feasts, 321.

The Sundays after Easter are *five* in number, and reckoned by their distance *from* the great Festival. The first one of these was formerly called Dominica in Albis, on account of the fact that persons, who had been baptized on Easter-eve, which was the great baptismal day of the year, continued to wear their white robes during Easter week and on this Sunday. The fifth Sunday after Easter was formerly called Rogation Sunday. It and the two following days were known as Rogation days, as early as A. D. 474, when they were ordered as fasts, and were especially devoted to the consideration of the mode of asking God so that we may obtain our requests. This feature is preserved in the Gospel for the day, and the collect has especial reference to our doing good in the future under divine guidance.

The Thursday following the fifth Sunday after Easter, that is Rogation Sunday, is called Ascension day. This is always forty days after Easter, and it is celebrated at this distance from the great festival, in commemoration of the days, which Christ passed on earth after His resurrection, which were forty in number.

The Sunday immediately following Ascension day is simply known as *the Sunday after Ascension day.* It is followed by Whit Sunday, called also the Feast of Pentecost, from the fact that it is exactly fifty days from Easter. This day is celebrated in commemoration of the descent of the Holy Spirit on the Apostles, after the Resurrection of the Saviour. The next day, or *Whit Monday,* is retained as a Holyday by the Reformed Church, to commemorate the gift of the Spirit to the Gentiles, under the preaching of St. Peter.

Sunday immediately following Whit Sunday is known as Trinity Sunday. The mystery of the Trinity is especially held in remembrance on this day. The Ambrosian hymn is required in the service, because it offers up especial thanks to the three personages of the Trinity, and has always been recognized as the highest form of adoration which an uninspired writer has composed. The festival prayers for the day dwell particularly upon the attributes peculiar to the different personages of the Godhead. In the English Church the Athanasian Creed is appointed to be said on this day.

The Sundays following Trinity, which vary in number from *twenty-two* to *twenty-seven*, are named as *after* Trinity, and they fill up the remainder of the Ecclesiastical year.

It will be observed that Easter regulates nearly the whole of the Church-year, determining when each of the moveable feasts shall be held. In order to recapitulate what we have said, we extract, as a sort of resume of the whole subject, the following by Prof. De Morgan :* "In the English nomenclature Easter Sunday has always the *six* Sundays in Lent immediately preceding, and the *five* Sundays after Easter immediately following. Of these, the nearest to Easter before and after, are *Palm* Sunday and *Low* Sunday (Dominica in albis); the farthest before and after, are *Quadragesima* (first in Lent), and *Rogation* Sunday (fifth after Easter). Preceding all these are, in reverse order, *Quinquagesima*, *Sexagesima*, *Septuagesima;* and following them in direct order, are the Sunday after *Ascension*, *Whit* Sunday and *Trinity* Sunday. So that Easter Sunday, as it takes its course through the Almanac, draws after it, as it were, *nine* Sundays, and pushes eight before it, all at fixed denominations. Looking farther back, every Sunday preceding Septuagesima, but not preceding the fixed day of Epiphany (Jan. 6th), is named as *of* Epiphany or *after* Epiphany: the least number of these being *one*, the greatest number *six*."

In addition to the days which are mentioned in this article, as the festival days suggested in the new Liturgy of the Reformed Church in America, other days are celebrated by the mother Church, in her German home, in commemoration of the Apostles or some incidents of special importance in the history of the Church. With the view of showing that such days were *once* recognized in this country by the Reformed Church, we may mention that, in an old Hymn book, the fourth edition of which was published by Ernst Ludwig Baisch in Philadelphia, (1774), purporting to be prepared for the use of the Reformed Church in Hesse, Hanau, the Palatinate and Pennsylvania, we find associated with the Heidelberg Catechism, and with forms of prayer for morning and evening private worship, a full series of gospel and epistles with collects for all the Sundays in the year, the other festivals recognized in the present Liturgy, and for *other* occasions. The latter are for the "*Sunday after New Year*," Tuesday after Easter, Tuesday after Whit Sunday, the day named St. Andrew's, St. Thomas, the conversion of St. Paul, the purification of the Virgin, St. Matthew, the Annunciation, St. Philip and St. James the less, St. John the Baptist, St. Peter and St. Paul, the Visitation of the Virgin to Elizabeth, St. James the Great, St. Bartholomew, St. Mathias, St. Michael the Archangel, St. Simon and St. Jude. This will show that the Liturgical movement involving as it does, to a certain extent, the celebration of these days of the old Church year, is not a novelty introduced by restless men into the service of religion, but is the result of an ardent yearning after the customs of our fathers, a warm desire for a form of worship which unites people and clergy in their church services. And we need not seek after this latter out of the limits of our mother Church, whose past history is filled with endearing recollections of our fathers. Their blood, in many cases, was shed in the establishment of its doctrines and principles when persecution opposed them with all its vilest terrors. Let not their sons be drawn irrevocably from the old land marks, and carried away out into the sea of non-liturgical agitation, where their poor barks will, like many others in the same position now, be tossed about by every wind of doctrine, having no sure reliance upon compass or star or any other guidance in the midst of the storm. The necessities of the devout soul, the idea of worship itself, respect for the early fathers of the Church, the duty of handing down doctrines pure and undefiled,—

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* Lardner on the Almanac, 19.

all these constitute an argument all powerful in favor of Liturgical worship with the son of the German Reformed Church, and by implication also they invoke his attention to the Church year. To this latter, as the nobler Calendar of the two we have considered, the purest thoughts and tenderest feelings of the soul cling as, next to God's own Sabbath, requiring the attention and reverence of the devout. In this view, the Ecclesiastical Calendar is a great boon from the Church to her members.

"As prisoners notch their tally-stick,
  And wait the far-off day,
So marks SHE days, and months and years,
  To ponder and to pray;
And year by year beginning new
  Her faithful task sublime,
How lovingly she meteth out,
  Each portion in its time."

ADDENDA.

RULE FOR DETERMINING EASTER SUNDAY.

(*Delambre's Astronomie,* [1814] *III,* 712.)

1. Divide the number of the year by 19, & call the remainder a.
2. “ “ “ by 4, “ “ b.
3. “ “ “ by 7, “ “ c.
4. “ $(19a + M)$ by 30, “ “ d.
5. “ $(2b + 4c + 6d + N)$ by 7, “ “ e.
6. Make M=15, and N=6 for the Julian Calendar.

In the Gregorian Calendar, M and N will have the following values:

	M	N
From 1582 to 1699	22	3
1700 to 1799	23	3
1800 to 1899	23	4
1900 to 1999	24	5
2000 to 2099	24	5
2100 to 2199	24	6
2200 to 2299	25	0
2300 to 2399	26	1
2400 to 2499	25	1

7. Easter day will either be

$(22 + d + e)$ of March, or

$(d + e - 9)$ of April.

This rule is absolute for the Julian Calendar. In calculations for the Gregorian Calendar, if a number is given over 24th of April, seven days must be substracted.

Applying these rules to the present year, 1858,

$$a=15$$
$$b=2$$
$$c=3$$
$$d=8$$
$$c=5$$

Hence Easter day is $(d+c-9)=(8+5-9)=4$th of April.

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